



Gregory Vlastos

STUDIES IN GREEK PHILOSOPHY

GREGORY VLASTOS

VOLUME I: THE PRESOCRATICS

Edited by Daniel W. Graham

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PREFACE

THIS PROJECT BEGAN with a note I wrote to Gregory Vlastos in the summer of 1991. Having just finished reading his *Socrates, Ironist and Moral Philosopher*, I was impressed that it was time to collect his many important articles for posterity. It was a task that should have been carried out years ago; but his constant involvement in new projects, together with his compulsion to revise earlier work to bring his reflections up-to-date had made it impossible for him to undertake the project. I offered to do the editorial work for him. A few days later I received a telephone call from Professor Vlastos. He asked if I were serious about my offer; I replied I was. With characteristic modesty he questioned whether anyone would be interested in his previous work; I assured him that there would be great interest. He then authorized me to undertake the project, stipulating that it should contain only works in ancient philosophy. In a note of authorization, he chose the modest title the work bears.

The format of this work is that of a *kleine Schriften* collection—a format not popular in the English-speaking world, as the rubric indicates. Early in the project we received an offer to publish selected essays of Professor Vlastos. I urged rejecting the offer, and Professor Vlastos concurred. The choice of Princeton University Press was dictated in part by the Press's commitment to keep in print *Platonic Studies*, which of course constituted the only previous collection of a systematic body of Vlastos essays. A number of Vlastos essays were collected in *Studies in Plato's Metaphysics*, edited by R. E. Allen (London: Routledge & Kegan Paul, 1965), and in the two volumes of *Studies in Presocratic Philosophy*, edited by David Furley and R. E. Allen (London: Routledge & Kegan Paul, 1970, 1975), and also in other anthologies. (Professor Furley has told me that one of his purposes in bringing out his anthology was to make Gregory's essays more available.) But the works mentioned are now out of print, and some important essays appear in works which are difficult to get access to, and in any case the essays are scattered abroad in many journals and collections. The justification for the present collection is simply the quality of the work and its prodigious impact on scholars of ancient philosophy. In that I trust these volumes will speak for themselves.

One of the major tasks preliminary to editing the present collection was identifying the essays to be collected. Professor Vlastos kept no comprehensive bibliography of his own numerous and multifaceted publications. In later years he kept a list of works published in recent years (incomplete, as it turned out) and for earlier publications referred to the bibliography published in his festschrift, *Exegesis and Argument* (E. N. Lee, A.P.D. Mourelatos, and R. Rorty, eds., Assen: Van Gorcum, 1973). To remedy gaps in available biblio-

ographies, a new bibliography that aims at being comprehensive is included at the end of Volume II of this collection. It has been eked out by computerized data bases, bibliographical journals, searches of journal indexes, tips from individuals, and references in footnotes. In it I have tried to include all publications, including nonphilosophical ones. I would like to be able to guarantee that it is complete, but I cannot. It will, however, provide a guide to most of Professor Vlastos's publications, with some notes on interrelations between the works that I hope will facilitate research.

Professor Vlastos passed away a few months after the beginning of this project. I received a note written only a few days before his death, providing instructions on certain details. I would wish that he had lived to provide a final say in the content and shape of these volumes. He did, however, approve the general format and aim. I have continued the project under the auspices of the children of Gregory Vlastos, Mari Vlastos and Stephen Vlastos, whose cooperation and good wishes have greatly aided my work. In particular Stephen, an academician himself, was able to give me advice on aspects of the project and negotiations with publishers, as well as helpful personal information. Professor Vlastos assigned Professor Myles Burnyeat as literary executor and editor of his projected sequel to *Socrates, Ironist and Moral Philosopher*, entitled *Socratic Studies*, forthcoming from Cambridge University Press. Essays intended for that volume are of course excluded from the present collection. I appreciate advice and information Professor Burnyeat has given me, including bibliographical information. It is appropriate that the current Laurence Professor should preside over the last publication of work inspired by the first Laurence Professor fifty-five years ago. I am also indebted to the staff of the Harry Ransom Humanities Research Center at the University of Texas at Austin, which has acquired the Vlastos papers, and in particular to Professor Alexander P. D. Mourelatos, who has overseen work on the Vlastos collection. On two occasions I have been able to go through relevant papers, including annotated copies of *Platonic Studies*.

I owe major debts to assistants and organizations here at Brigham Young University. The essays were scanned into computer-readable form on a scanner, then cleaned up by assistants, and only then given a final proofing and editing by me. My thanks go to assistants John Armstrong, Chen Minhua, Tim Hiatt, and Mark Olsen. Linda Hunter Adams assigned her editing class (English 410R) in Winter Semester 1993 to edit manuscripts for this project, with Mark Olsen as taskmaster. To the class and their teacher I owe a great debt. The Department of Philosophy has supported the work of research assistants and has made available its computer resources and copying facilities.

For biographical information I am grateful to Alexander Mourelatos, to Stephen Vlastos, and to Professor Robert Meister, as well as to the Department of Philosophy of Princeton University. I have benefited from conversations with Professor David Furley and many other friends and associates of Professor Vlastos.

I wish to express gratitude to the many publishers of Professor Vlastos's essays for their generosity in granting permission to reprint his works. What I anticipated would be a major headache turned out to be a pleasant experience with very few problems. Full credits are given in the Acknowledgments page of the respective volumes.

A brief word on the contents of these volumes: Although this work is intended as a "complete" collection of uncollected essays in ancient philosophy, the decision on what to include and what not to include was by no means simple. Some essays were revised in later versions; some were replaced by others; some were repudiated by their author; there were reference articles and reviews. In general I have attempted to include contributions that have not been superseded by later essays. But one notable exception is "The Third Man Argument in the *Parmenides*" (1954), which was replaced by "Plato's 'Third Man' Argument" in *Platonic Studies*. The earlier essay had such a great impact on the philosophical world (see Introduction below) that it had to be included. A number of recent essays on Socrates, on this principle, have been superseded by revised versions in *Socrates, Ironist and Moral Philosopher* and the forthcoming *Socratic Studies*. As to reviews, I have included longer reviews making more substantive points, omitting shorter and less argumentative ones. Among reference articles, views in his "Zeno" in W. Kaufmann, ed. *Philosophical Classics* (Prentice-Hall, 1961) are largely repudiated in later articles; I have omitted that article. But his "Zeno of Elea" for the *Encyclopedia of Philosophy*, while it incorporates material from his several articles, goes beyond them in providing a comprehensive interpretation of Zeno; therefore I have included it. Recent debates about the effects of a "Canon" of works on education make one sensitive to the dangers of distorting a scholar's image by the selective "approved" reading list. I can only hope that the present collection is as representative as possible of Professor Vlastos's contributions in ancient philosophy, and that those who have specialized interests will consult the Bibliography at the end of Volume II for related works.

A note on the texts that follow: For reprinted articles I have collated the reprints with the originals, noting nontrivial changes (see the Note on Textual Conventions). I have transliterated shorter Greek passages (unless some technical philological or textual point is being made) to make them more accessible to a larger audience. The articles of the present collection were published over a long period of time in different journals from different countries representing different scholarly fields. Conventions differ from journal to journal, from country to country, from field to field; in addition styles have changed over the half-century represented in the collections. In an effort to introduce a modicum of uniformity into the essays, my copy editor, Marta N. Steele, has made a major contribution in standardizing citations and references. In general she has eliminated *op. cit.* and the like in favor of shortened titles, which should make it somewhat easier to navigate the footnotes. Fuller bibliographical citations have often been added. On matters of the author's text, however,

I have been stolidly conservative. When Professor Vlastos passed away, his text became for me a historical artifact that I was unwilling to alter, except in a few cases where a phrase was excessively obscure or there was an obvious omission. Present style dictates the elimination of gender-biased language. I have gathered from marginal notes to his copies of *Platonic Studies* that Professor Vlastos was sensitive to this change. And he was almost obsessive in his drive constantly to update and revise his writings. But I have refrained from rewriting his text myself to introduce this or any other stylistic changes. If this offends, I hope the blame will be laid at the feet of the editor rather than of the author. There are occasional places where the author's usually lucid and vigorous style becomes dense and the verbiage sesquipedalian; nevertheless, to most proposed changes of expression my answer has been a resolute "stet."

In the articles all translations are those of Professor Vlastos unless otherwise noted. Editing conventions are explained in the Note on Textual Conventions below.

Finally, I give thanks to Kevin Bowring for the General Index to Volume I, to Mark Olsen for the *Indices Locorum* of both volumes, and to Crystal Willis and Jan-Erik Jones for the General Index to Volume II.

ACKNOWLEDGMENTS

THE PAPERS in this volume were previously published as noted below. The editor and the heirs of Gregory Vlastos gratefully acknowledge the permission to reprint granted by the agencies indicated.

1. "Theology and Philosophy in Early Greek Thought"
PQ 2 (1952): 97-123
Blackwell Publishers, Oxford
2. "Solonian Justice"
CP 41 (1946): 65-83
The University of Chicago Press, Chicago
3. "Equality and Justice in Early Greek Cosmologies"
CP 42 (1947): 156-78
The University of Chicago Press, Chicago
4. "Isonomia"
AJP 74 (1953): 337-66
The Johns Hopkins University Press, Baltimore
5. Review of F. M. Cornford, *Principium Sapientiae*
Gnomon 27 (1955): 65-76
C. H. Beck'sche Verlagsbuchhandlung, Munich
6. "On Heraclitus"
AJP 76 (1955): 337-68
The Johns Hopkins University Press, Baltimore
7. "Parmenides' Theory of Knowledge"
TAPA 77 (1946): 66-77
The American Philological Association
8. Review of H. Fränkel, *Wege und Formen frühgriechischen Denkens*
Gnomon 31 (1959): 193-204
C. H. Beck'sche Verlagsbuchhandlung, Munich
9. Review of J. E. Raven, *Pythagoreans and Eleatics*
Gnomon 25 (1953): 29-35
C. H. Beck'sche Verlagsbuchhandlung, Munich
10. "Zeno's Race Course: With an Appendix on the Achilles"
JHP 4 (1966): 95-108
Journal of the History of Philosophy, St. Louis
11. "A Note on Zeno's Arrow"
Phronesis 11 (1966): 3-18
Van Gorcum, Assen, the Netherlands

12. "A Zenonian Argument Against Plurality"
J. P. Anton and G. L. Kustas, eds., *Essays in Ancient Greek Philosophy* (State University of New York Press, 1971), pp. 119–44
State University of New York Press, Albany
13. "Zeno of Elea"
In Paul Edwards, editor in chief, *Encyclopedia of Philosophy* (Macmillan, 1967), vol. 8, pp. 369–79
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14. "Plato's Testimony Concerning Zeno of Elea"
JHS 95 (1975): 136–62
Society for the Promotion of Hellenic Studies, London
15. "The Physical Theory of Anaxagoras"
PR 59 (1950): 31–57
In the public domain, as certified by the managing editor of *The Philosophical Review*, Cornell University, Ithaca, N.Y.
16. "Ethics and Physics in Democritus"
PR 54 (1945): 578–92, and 55 (1946): 53–64
In the public domain
17. "On the Pre-History in Diodorus"
AJP 67 (1946): 51–59
The Johns Hopkins University Press, Baltimore

Essays (1), (3), (5), (6) [in part], (8) [in part], (9), (10), (11), (15), and (16) were reprinted in D. J. Furley and R. E. Allen, eds., *Studies in Presocratic Philosophy* (London: Routledge & Kegan Paul, 1970 and 1975). My thanks to Routledge for permission to print changes to the essays made in the reprints.

INTRODUCTION

IN ONE SENSE the essays of Gregory Vlastos need no introduction. It was their self-evident brilliance that raised their author to a station of prominence in the academic world—first among specialists, and then among nonspecialists. Many tributes have been offered to him in recent months. Here I propose to offer a brief resume of his life, not to improve on what has been said elsewhere, but simply to record for posterity, in whatever poor fashion these few pages permit, the breadth and complexity of the man, with the hope that these volumes may continue in use beyond the present generation, preserving the memory of their remarkable author. I shall append a few remarks about the essays of this first volume.

Born July 27, 1907, in Istanbul—the Constantinople of the Christian Roman Empire, Byzantium of ancient Greece—Gregory Vlastos was raised in the Protestant faith: his father Kimon was a Greek convert, his mother Elizabeth the daughter of a Scottish missionary father, James Stark Dewar, and a Greek-English mother, Loukia Evannidis. Growing up in the turbulent time of World War I and the subsequent war between Greece and Turkey, he was nevertheless able to obtain an education at the American-sponsored Robert College in Istanbul, graduating in 1925, and then to come to America for further education. Attending Chicago Divinity School, he obtained a bachelor of divinity degree in 1929 and became an ordained minister. He went on to study philosophy at Harvard University, where he was awarded a Ph.D. in 1931, after completing a dissertation entitled "God as a Metaphysical Concept" under the direction of Alfred North Whitehead.

Vlastos accepted a position at the Queen's University, Kingston, Ontario, where he would become a Canadian citizen. In 1932 he married Vernon Abbott Ladd, who became his colleague and confidant. Active as a Christian socialist, he wrote *The Religious Way* (1934),¹ co-edited *Towards the Christian Revolution* (1936), and wrote *Christian Faith and Democracy* (1939), while his wife was a leader in groups such as the Women's International League for Peace and Freedom. Vlastos continued to be interested in Whitehead's philosophy, publishing "Organic Categories in Whitehead" (1937). In 1938 Vlastos went to Cambridge to pursue a growing interest in Greek philosophy under the tutelage of F. M. Cornford, whose important commentary on the *Timaeus*, *Plato's Cosmology*, had just appeared. Vlastos wrote a paper criticizing Cornford's allegorical reading of the creation of the world in the *Timaeus*. Cornford generously encouraged him to publish it in *Classical Quarterly*, where the essay "The Disorderly Motion in the *Timaeus*" appeared

¹ A bibliography of Gregory Vlastos's works is included at the end of Volume II of this work.

the following year. During his leave Vlastos had worked up a book manuscript, "Religion and the State in Plato," reflecting his several interests, which he decided was not ready for publication. He filed it in a drawer.

As World War II broke out, Vlastos joined the Royal Canadian Air Force, in which he served as a Squadron Leader of the Personnel Division and editor of *Canadian Affairs*, a publication of the Wartime Information Board. At the conclusion of the war, he returned to academic life, focusing his research on a series of studies of Greek political ideas. Displaying an impressive knowledge of Greek history and skill in the tools of classical philology, largely self-taught, as well as a sensitivity to important turning-points in the history of ideas, he published sweeping studies on Greek ideas such as "Solonian Justice" (1946) and "Equality and Justice in Early Greek Cosmologies" (1947)—which identified political ideas influencing the development of Greek philosophy—and important individual studies of Presocratic philosophers, "Ethics and Physics in Democritus" (1945) and "Parmenides' Theory of Knowledge" (1946). Scholarly recognition brought him the offer of a position at the Sage School of Philosophy at Cornell University, a center of the new style of analytic philosophy which, imported from Britain and Austria, was taking over American philosophy. At Cornell Vlastos served as what he described as a "superannuated graduated student," learning the new methods especially from Max Black, and enjoying an association with a leading classicist and student of ancient philosophy, Friedrich Solmsen. He continued to publish seminal studies in early Greek philosophy in "The Physical Theory of Anaxagoras" (1950), "Theology and Philosophy in Early Greek Thought" (1952), and "Isonomia" (1953).

On the strength of these studies, Vlastos was invited to be a fellow of the Institute for Advanced Study at Princeton for 1954–55. There he was able to work with another leading student of ancient philosophy, Harold Cherniss. Cherniss's seminar on Heraclitus influenced his own study of that philosopher in "On Heraclitus" (1955). Vlastos's progress in Greek philosophy is evident in his review of F. M. Cornford's posthumous *Principium Sapientiae*, in which the student respectfully but effectively demolished the premises of his mentor's later work. But, unsatisfied with his own efforts to date, Vlastos set out finally to write the book on Plato that had always eluded him. By concentrating on the Socratic dialogues, he hoped to finish a book manuscript, as indeed he did. But again his high standards of scholarly rigor and his capacity for ruthless self-criticism prevented him from publishing: he had not solved the riddle of the early dialogues. Again, he put his manuscript in a drawer.² Nevertheless, his star continued to rise: the most spectacular event of the period for ancient philosophy studies was the publication of "The Third Man Argument in the *Parmenides*" (*Philosophical Review*, 1954). In a truly epoch-

² His essay "Graduate Education in the Humanities: Reflections and Proposals" (1980c in Bibliography) expounds his views on quality over quantity in research.

making way, his analysis of Plato's argument using the tools of contemporary philosophy turned the heads of even the most non-historically-minded philosophers. Critical reappraisals by leading American philosopher Wilfred Sellars and leading British philosopher Peter Geach followed immediately, beginning a deluge of articles that created a new topos in the literature. And both philosophers and historians of philosophy benefited. Vlastos more than held his own against his distinguished critics by insisting that an adequate interpretation must do more than solve the philosophical problem: it must be grounded in the text. Meanwhile Platonic studies were invigorated by Wittgensteinian conceptions of standard measures and by the use of modern tools of logic and analytic metaphysics.

In later years Vlastos was heard to lament the Pandora's box of controversy he had opened with his paper. But the significance of the event is much greater than the paper itself. Vlastos was precipitating a revolution in the role and practice of historical scholarship, and in particular in the status of ancient Greek philosophy. The new philosophy that came to dominate the American scene after World War II was predominantly a- or anti-historical: in accordance with the claim that all philosophical problems were problems of language (in some version or another), the philosopher was to analyze appropriate concepts or pieces of discourse to arrive at clarification. In this there was no place for the history of philosophy—no place in the tradition of the Logical Positivists of Vienna, for whom the only relevant history was of science rightly carried out: no place in Wittgenstein, who could hardly bring himself to read other philosophers; and only a limited place in Bertrand Russell insofar as philosophy anticipated modern distinctions. Philosophy consisted largely of brief, incisive essays on abstract concepts using symbolic logic or other tools of analysis in texts without footnotes or bibliographies, written by authors with Anglo-Saxon surnames and initials.

What Vlastos had done was to take the tools of the new philosophy and of philology and to apply them to an ancient text, to show that Greek philosophers were philosophers with whom modern analysts might have a conversation. He demonstrated that one might have philosophy *and* history, arguments and footnotes, logical sophistication and philological rigor. It was not as if philosophy and philology had never cooperated before;³ but what Vlastos pro-

³ Only at Oxford was there a strong tradition of combining history of philosophy with philosophy; but even there, while the same philosophers often studied contemporary problems and ancient texts (e.g., W. D. Ross and Gilbert Ryle), they did not necessarily feel compelled to apply modern methods to the ancient authors. At Cambridge, meanwhile, the ancient philosophers were mainly the domain of classicists such as F. M. Cornford and W.K.C. Guthrie, who, though gifted scholars with significant philosophical insights, were indifferent or opposed to exploiting modern philosophical methods. G.E.L. Owen, a product of Oxford, was destined radically to change the situation at Cambridge. Vlastos himself dated the beginning of the new style of ancient philosophy to a seminal work of Richard Robinson (of Oxford), *Plato's Earlier Dialectic*, first published in 1941, a work that had a profound influence on Vlastos.

vided was a model—a paradigm—for a marriage of disciplines that would suit the new analytic philosophy. And in the process ancient philosophy became mainline philosophy.

By now Vlastos was a force to be reckoned with, and his accomplishments were rewarded with an offer by Princeton University to join its philosophy department as Stuart Professor. Here Vlastos came into his own as a leading figure in the life of American higher education. His graduate Plato seminar became famous as an initiation into graduate study. He demanded the best of his students and in Socratic fashion claimed to learn more from them than they learned from him. He formulated elaborate responses to student suggestions, he gave detailed evaluations of papers, and he became a mentor to his students both during their graduate studies and long afterward. Besides his work in ancient philosophy, he published important essays in social and political philosophy: "Justice" (1957), and "Justice and Equality" (1962), the latter of which was anthologized several times. In his department Vlastos was called on to serve as chairman for two long terms, beginning in 1960 and 1970, respectively, and repeatedly as member of the Committee of Three, an important university committee. It is not a coincidence that during this period Princeton came to be recognized as first or second in rank in the nation among philosophy departments. Vlastos recruited the best people, charming them by his Socratic attitude of seeking to learn from them. His attitude was no pose: it was precisely by his ability to learn from the best minds around him that he became adept at new methods. He was further active in professional duties, as organizer and fund-raiser for many projects, such as the Council of Philosophical Studies, founded in 1964, and as academic administrator, serving as president of the Eastern Division of the American Philosophical Association, 1965–66. True to his moral and political commitments, he became an activist in the movement against the Vietnam War (as he had earlier been an opponent of McCarthyism) and applied for U.S. citizenship (awarded in 1972) in order to work more effectively in that cause. Throughout this period he continued to pour out important articles and reviews in ancient philosophy, focusing particularly on Plato and sometimes on Socrates, whose ideas, he became convinced, could be reconstructed from the early Platonic dialogues. In 1960 he gave the John Locke Lectures at Oxford University on "Mysticism and Logic in Greek Philosophy," again showing his wide range of knowledge and interest.

One of his most important contributions to ancient philosophy scholarship was his development of a joint program in philosophy and classics for graduate students. The Classical Philosophy Program became a model for interdisciplinary studies offering training for future scholars in the field.⁴ David

⁴ Interdisciplinary programs already existed at a few universities, but with a humanistic emphasis that at least was not perceived to focus on the problems of philosophy. Interdisciplinary programs were especially needful in America, where classical languages were not a typical part of secondary education.

Furley was recruited by the Princeton classics department to provide leadership for the program. Vlastos also attempted to recruit a rising star from Oxford, G.E.L. Owen, whom he could not lure to Princeton. But Owen did come to Harvard in 1966 and founded in New York a reading group to promote interaction among ancient philosophy scholars. Owen later returned to England to become Laurence Professor of Ancient Philosophy in the University of Cambridge (the chair first held by Cornford), to bring the disciplines of philosophy and classics together. In America Vlastos's students from both Cornell and Princeton took leading posts and carried forth the gospel that Greek philosophy was important for understanding contemporary philosophy—and vice versa. Throughout the world, ancient philosophy scholarship had come of age. No longer the unwanted stepchild of philosophy or classics, ancient philosophy was respected and honored by the appointment of a specialist at every significant philosophy department.⁵ Joint programs arose at other universities, conferences and symposia on ancient philosophy were held, and journals were founded, while in the larger professional world students of Greek philosophy became known for the rigor of their training, their love of interaction with their peers, and their general esprit de corps. Indeed, one of the factors which brought so much vitality to the growing community of ancient philosophy scholars was just its social dimension that pioneers such as Vlastos and Owen did so much to promote—the habit the computer age calls networking. Ancient philosophers became a tightly knit community within larger academic associations. A high point of the movement came with the NEH Summer Institute on ancient philosophy held at Colorado College in 1970. Leading figures from around the world attended; but Gregory Vlastos was for many the most memorable figure, in both his scholarly dedication and his generous attention to the work of others.

Tragedy struck Vlastos in 1970 with the death of his beloved wife. Yet despite personal misfortune and the approach of normal retirement age, Vlastos continued to work tirelessly, delivering the Jessie and John Danz lectures at the University of Washington in 1972—published as *Plato's Universe* (1975)—and bringing out in 1973 his *Platonic Studies*, containing many of his most important papers on Plato and Socrates of the Princeton years, often with significant revisions or additional notes. In the same year students and colleagues honored him with a festschrift, *Exegesis and Argument*, on what could have been his retirement year. At the same time he began to work for the creation of a National Humanities Center, which he personally conceived of and for which he found backers, funding, and a home, so that it became a reality five years later in Research Triangle Park in North Carolina.

⁵ The importance of the institutional place of ancient philosophy studies in philosophy departments can be seen by contrast with the situation in classics departments, where philosophy has not yet been recognized as a specialization in itself, except at a few universities where there are interdisciplinary programs. Generally a classicist interested in philosophy must advertise himself or

Vlastos formally retired from Princeton in 1976 and moved to Berkeley, where he became permanent Mills Visiting Professor, teaching seminars to graduate students and seven times his NEH Summer Seminar on the Philosophy of Socrates. He again returned to the Socratic dialogues and to the puzzle of Socrates, whom he had never been able to comprehend to his own satisfaction. A new generation of students, graduate and postdoctoral, became the beneficiaries of his researches. The Platonic Socrates, in a way a man so much after his own heart, became his obsession for the last fifteen years of his life. During this time he produced a brilliant series of papers on Socrates, inspired in part by his reaction to the work of one of his most renowned students, Terence Irwin, and stimulated by criticism from his audiences at lectures and seminars. During this time he gave the Gifford Lectures at the University of St. Andrews, Scotland (1981); the Howison Lectures at the University of California, Berkeley (1984); the Townsend Lectures at Cornell University (1984); and the Whitehead Lectures at Harvard University (1987). He was also Senior Mellon Fellow of the National Humanities Center, 1980–81 and 1981–82; and then Distinguished Professorial Fellow at Christ's College, Cambridge, in 1983; again fellow of the Institute for Advanced Study, Princeton, 1984–85; and finally fellow of the MacArthur Foundation. The fruits of his researches on Socrates appeared in the 1991 publication of *Socrates, Ironist and Moral Philosopher*. A projected sequel volume, *Socratic Studies*, is being prepared by Myles Burnyeat. Gregory Vlastos passed away on October 12, 1991, in Berkeley, California, after a prolonged and courageous struggle with cancer.

The era of his activity in Greek philosophy, which we may date from 1938 to 1991, over a half-century, coincided with the rise of Greek philosophy to a secure place in the discipline of philosophy. Vlastos's own life is inextricably connected with that rise. And although it would be an invidious claim—and one that he himself would resist—to say that Gregory Vlastos was the moving cause of that rise, one can safely claim that no one did more to make ancient philosophy studies what they are today in the United States. One token of not only his influence but his dedication is the extent of his correspondence with other scholars. He corresponded with literally hundreds of scholars, with whom he often engaged in lengthy and detailed discussion on their own, and his work.⁶ He was a modern-day Leibniz, sharing himself with both the

himself as a specialist in Greek (or Latin) prose and convince prospective departments that he or she is proficient in nonphilosophical as well as philosophical texts.

⁶ One small example of his influence is found in M. C. Stokes, *One and Many in Presocratic Philosophy* (Washington, D.C., 1971), p. 40 and n. 61. On the question of why the early Ionians sought to explain the world in terms of a single stuff or set of stuffs, Vlastos in correspondence suggested a natural transition from "all the X's come from Y and Z" to "all the X's are Y and Z." Stokes notes that Vlastos's interpretation gives "a motive more substantial than any hitherto seen in print" (ibid., p. 40). Eight years later Jonathan Barnes would develop at length the same insight

established authority and the struggling beginning scholar, without respect of persons and unsparing of himself, even in failing health, ever prompt, always apologetic if more than a few days intervened between a letter and a reply. As one scholar whose life had been changed by Gregory Vlastos the mentor expressed it, "He set a standard for humanity that no one today can live up to."

Although his name will forever be connected with the methods of analytic philosophy, it is important to recognize that Vlastos was no mere popularizer of Greek philosophy to analytic philosophers. He insisted on strict adherence to evidence in the text, and when he saw no evidence for a plausible philosophical reconstruction, he rejected it—as is evidenced in some of his replies concerning the Third Man Argument. Moreover, he searched for and achieved a kind of comprehensive understanding of the philosophers he studied that goes far beyond the aims of analytic philosophy, strictly conceived: he was not content simply to understand an argument or a theory—say the Third Man Argument or the Theory of Forms—but he was always working toward a synthetic understanding of the philosopher. Nor was he content with understanding the individual philosopher. As many of the concept studies in this volume demonstrate, he saw the philosophers as part of a larger picture of philosophical and general intellectual development. Those who know him as the author of "The Third Man Argument in the *Parmenides*" should not overlook those earlier studies in Greek politics, religion, and science that formed the essential background for his understanding of Greek philosophy. For him the methods of analytic philosophy were a powerful means to an end; but his end surpassed the goals of most analytic philosophers. For he aimed at nothing less than a comprehensive understanding of early Greek philosophy in its full historical and cultural context.

In "Theology and Philosophy in Early Greek Thought," Vlastos takes on two accounts of the religious views of the Presocratic philosophers, those of John Burnet and Werner Jaeger. Against Burnet's attempt to maintain that the Presocratics were mere naturalists without views on religion, Vlastos objects that his view is too narrow to fit the facts; against Jaeger's views on the "theology" of the Presocratics, Vlastos objects that their views do not amount to a theology, but that, with few exceptions, they attempt to assimilate to nature the properties traditionally ascribed to the gods. He thus arrives at a balanced account of the views of religion found among the Presocratics: neither complete scientists nor traditional followers of, nor theorizers about, religion, they naturalize religion by assigning religious values to nature.

In "Solonian Justice," "Equality and Justice in Early Greek Cosmologies," and "Isonomia," we see an interconnected series of studies that explore early

(*The Presocratic Philosophers*, vol. 1 [London, 1979], ch. 3). Vlastos's correspondence presumably came at a time when he was no longer actively pursuing research in the Presocratics.

Greek conceptions of justice and then show how they apply to Presocratic physical theories. "Solonian Justice" is perhaps the essay in this volume most removed from Presocratic studies; nevertheless, it forms the foundation of Vlastos's understanding of the nature of justice which makes the later studies possible. "Equality and Justice" is a masterpiece of interdisciplinary study. Vlastos shows how early Greek political notions of equality and justice are reflected in medical theory and natural philosophy, as he traces their influences backward to their first expression in Anaximander, for whom cosmic justice is seen as a product of cosmic equality. "Isonomia" studies a term that Vlastos argues was the predecessor of *demokratia* as an expression of popular government. In a sensitive study of *isonomia* and related terms, ranging over medical theory, literature, history, and politics, he shows how the term, signifying the egalitarian distribution of power, ultimately provides the background for Anaximander's conception of cosmic justice. This brilliant study in the history of ideas seems to have been unduly neglected; Vlastos's sequel "*Isonomia Politike*" (1964), a reaction to a later contribution by A. W. Gomme, was reprinted in *Platonic Studies*, presumably as the definitive study. But the later study, based on a close reading of several disputed passages, is much more a detailed work for specialists, whereas the earlier study is a history of ideas in the grand style, unmatched in its sweep and synthetic power. Finally, in the review of F. M. Cornford's *Principium Sapientiae*, Vlastos reveals his firm grasp of science and scientific method in his refutation of his mentor's dichotomy between the allegedly unscientific Ionians and the scientific physicians; against Cornford's earlier thesis that Greek philosophy grew out of religion, Vlastos asserts his own theory that democratic political ideas were responsible for Presocratic philosophy.

The essay "On Heraclitus" is the follow-up to a brief review of G. S. Kirk's *Heraclitus: The Cosmic Fragments*, in which Vlastos, arguing that some of the fragments Kirk wished to reject should be retained, goes on to develop an account of how Heraclitus' theory is a response to earlier Ionian thought.

In "Parmenides' Theory of Knowledge," Vlastos examines fr. 16 and finds in it a theory not of knowledge but of sense-perception. In his review of Hermann Fränkel's *Wege und Formen frühgriechischen Denkens*, he reflects further on Parmenides fr. 16 and discusses in detail Zeno fr. 1 and Anaxagoras fr. 4a. His review of J. E. Raven, *Pythagoreans and Eleatics* provides a convincing refutation of the then widely held view that the Eleatics were reacting to lost Pythagorean doctrines. A series of studies from the 1960s and 1970s constitute Vlastos's latest studies in the Presocratics and show his mastery of logical analysis and his concern for faithfulness to the text. The fruits of his individual studies, "Zeno's Race Course," "A Note on Zeno's Arrow," and "A Zenonian Argument Against Plurality" (the last published years after it was written) are incorporated in his encyclopedia article, "Zeno of Elea," which provides a comprehensive account of Zeno. In "Plato's Testimony Con-

cerning Zeno of Elea," Vlastos defends a traditional assessment of Zeno as orthodox follower of Parmenides against revisionary accounts by Kurt von Fritz and especially Friedrich Solmsen (in "The Tradition about Zeno of Elea Reexamined," *Phronesis* 1971)—although Solmsen's role in provoking the argument is scarcely evident in the paper.

"The Physical Theory of Anaxagoras" develops an account of Anaxagoras' difficult theory of matter, taking his concept of the seed as central. In this essay we can glimpse Vlastos's control of the Hippocratic corpus and his ability to interrelate Greek medical theory and Greek philosophy. The essay is still an important starting point for research on Anaxagoras, though it is one of his more speculative reconstructions (as Vlastos himself admits in a note to the reprint), one based on what seem to me to be obsolete principles.⁷ In "Ethics and Physics in Democritus," Vlastos attempts to show that, despite arguments to the contrary, Democritus' ethical principles do grow out of his physical theory, so that even though Democritean nature is a domain where necessity rules, naturalism does not preclude ethical norms. "On the Pre-History in Diodorus" argues that the cosmogony and anthropology in Diodorus' account do indeed reflect Democritean theory, even if at second hand.

Professor Vlastos was a master of the essay format in an age when the philosophical essay was the major form of scholarly presentation. These essays, written as they are over a period of a half century, stand up well to the test of time. Indeed, some of them mark boundaries between what now seem naive views of a more credulous age and rigorously critical interpretations. In their pages the reader will find philological dissertations in footnotes, devastating refutations in asides, and pioneering reinterpretations in appendixes. His papers opened doors to new research programs while his book reviews closed doors on several old research programs. At their best his essays exhibit the timeless power of truly great scholarship, when logical analysis and philology meet to make historical texts come alive as philosophy. I intend this volume as a *klēma eis aei*, for I think scholars of the present on rereading these essays will be reminded of why Gregory Vlastos wore the academic laurel wreath; and future scholars who wonder "Why did everyone make such a fuss about

⁷ Vlastos makes his interpretation of Anaxagoras' seeds pivotal; but this may be to explain *obscurum per obscurius*. In fact there is not to this day agreement about how to understand the seeds. More problematic still is Vlastos's acceptance of the Tannery-Burnet thesis, according to which material substances are constructed out of primitive contraries such as hot and cold, wet and dry: (a) there is no textual evidence for such a construction; (b) if Anaxagoras accepted such a construction, why did he have scruples against a limited number of stuffs? That is, if one type of thing can in principle be reduced to another, why should not one type of stuff be reducible to another? (c) The datum allegedly explained by the Tannery-Burnet thesis, namely how everything is in everything, could be explained more economically by other means. Although the Tannery-Burnet thesis was dominant when Vlastos wrote the article (some leading scholars still hold it), it is the kind of view that elsewhere Vlastos shows an uncanny ability to sniff out and expose.

Gregory Vlastos?" will find at least a partial answer in these pages. But the present work is not offered as dead canon, a source for *ipse dixit* authority, nor would the author of these essays countenance such a use. What these essays offer is a starting point for further debate, a *terminus a quo* for understanding Greek philosophy. Their author was a consummate controversialist in life; in death there is no greater memorial for him than that he, like his beloved Socrates, should continue to provoke debate—should continue to bring to life the philosophy of ancient Greece. Insofar as we allow him to do that, he will be, indeed, Byzantium's last gift to us.

TEXTUAL CONVENTIONS

EACH ARTICLE has been reprinted with pagination from the original publication included. In accordance with the scheme of *Platonic Studies*, the original page numbers are enclosed in [brackets], indicating the *end* of a page in the original article. Thus [75] marks the end of page 75 of the original article and the beginning of page 76.

Two asterisks within angle brackets (**) indicate that a cited article has been reprinted in these volumes. Where the asterisks are followed by folios

xv, the latter represent a specific reference within the reprinted article.

"Double brackets" in the text or notes indicate that material was deleted in the reprint; material in {braces} was added in the reprint; and material in (angle brackets) was added by the editors of these volumes.

ABBREVIATIONS

Note: Alternate forms are given where different abbreviations are used in different articles.

AUTHORS

Ael.	Aelianus
Aesch.	Aeschylus
Aet.	Aetius
Anax.	Anaximander
Anaxim.	Anaximenes
Andoc.	Andocides
Archil.	Archilochus
Arist.	Aristotle
Aristoph.	Aristophanes
Athen.	Athenaeus
Cic	Cicero
Democ.	Democritus
Demosth.	Demosthenes
Diod. Sic./Diod.	Diodorus Siculus
Diog. Laert./DL	Diogenes Laertius
Emp./Emped.	Empedocles
Ep	Epicurus
Epich	Epicharmus
Eur	Euripides
Hdt.	Herodotus
Heracl.	Heraclitus
Hipp.	Hippocrates
Hippol.	Hippolytus
Iambli.	Iamblichus
Is.	Isaeus
Isoc./Isocr.	Isocrates
Lucret./Lucr.	Lucretius
Lycurg.	Lycurgus
Lys.	Lysias
Mel.	Melissus
Parm.	Parmenides
Paus.	Pausanias
Pherec.	Pherecydes
Plut.	Plutarch

Polyb.	Polybius
Procl.	Proclus
Semon.	Semonides
Sext.	Sextus Empiricus
Simplic.	Simplicius
Soph.	Sophocles
Tertull.	Tertullian
Theophr.	Theophrastus
Thuc.	Thucydides
Xen./Xenoph	Xenophon

TITLES

AE LIANUS	
N.H.	<i>De natura animalium</i>
AE SCHYLUS	
Ag.	<i>Agamemnon</i>
Choe.	<i>Choephoroi</i>
Eum.	<i>Eumenides</i>
PV/P.V.	<i>Prometheus Vinculus</i>
Theb.	<i>Seven against Thebes</i>
ALEXANDER	
Metaph./Met.	<i>In Aristotelis Metaphysica commentaria</i>
ARISTOPHANES	
Ach.	<i>Acharnenses</i>
Ran.	<i>Ranae</i>
Thesm.	<i>Thesmophoriazusae</i>
ARISTOTLE	
An. post.	<i>Posterior Analytics</i>
Ath. pol.	<i>Athēnaiōn politeia</i>
De an.	<i>De anima</i>
De gen. anim.	<i>De generatione animalium</i>
De gen. et cor.	<i>De generatione et corruptione</i>
De iuv.	<i>De iuventute</i>
(Ps.-) De lineis insec.	<i>De lineis insecabilibus</i>
De mem.	<i>De memoria</i>
De part. anim.	<i>De partibus animalium</i>
De resp.	<i>De respiratione</i>
De soph. el. (Soph. el.)	<i>Sophistici elenchi</i>
E.N.	<i>Nicomachean Ethics</i>
Hist. anim.	<i>Historia animalium</i>

(Ps.-) Mech. probl.	<i>Problemata mechanica</i>
Met.	<i>Metaphysics</i>
Meteor.	<i>Meteorologica</i>
Phys.	<i>Physics</i>
Pol.	<i>Politics</i>
(Ps.-) Probl.	<i>Problemata</i>
Rhet.	<i>Rhetoric</i>
Top.	<i>Topics</i>
CICERO	
Acad.	<i>Academicæ Quaestiones</i>
Acad. prior.	<i>Academica priora</i>
De fin.	<i>De finibus</i>
ND/De nat. deorum	<i>De natura deorum</i>
DEMOSTHENES	
Ag. Timarch.	<i>Against Timarchos</i>
Ag. Timocr.	<i>Against Timocrates</i>
C. Lucrit.	<i>Against Lacrites</i>
Or.	<i>Orations</i>
2 Phil.	<i>Second Philippic</i>
DIOGENES LAERTIUS	
Vitae Philos.	<i>De clarorum philosophorum vitis . . . libri decem (etc.)</i>
EPICURUS	
Ep. ad Hdt.	<i>Letter to Herodotus</i>
Ep. ad Pyth.	<i>Letter to Pythocles</i>
EPIPHANIUS	
Adv. haer.	<i>Adversus haereses</i>
EURIPIDES	
Alc.	<i>Alcestis</i>
Bacch.	<i>Bacchae</i>
Cycl.	<i>Cyclops</i>
El.	<i>Electra</i>
Hel.	<i>Helen</i>
Hippol.	<i>Hippolytus</i>
Or.	<i>Orestes</i>
Phoen.	<i>Phoenissae</i>
Suppl.	<i>Supplices</i>
GALEN	
De natur. facult.	<i>De naturalibus facultatibus</i>
Histor. philos.	<i>Historia philosophica</i>

HERACLITUS (HOMERICUS)

Quaest. Homer. *Quaestiones Homericæ*

HESIOD

Op. *Works and Days*
Th./Theog. *Theogony*

HIPPOCRATES

Art. *Peri arthrôn embolēs*
Epid. *Epidēmiai*
De flat. *Peri phusôn (De flatibus, On Breaths)*
De nat. hom. *Peri phusios anthrôpou (De natura hominis, On the Nature of Man)*
De nutr. *Peri trophês (De nutrimento)*
On Anc. Med. *Peri archaiês iatrikês (On Ancient Medicine)*
On Sacr. Dis. *Peri hieres nousou (On the Sacred Disease)*
Peri top. k. anth. *Peri topôn tôn kata anhrôpon*
Progn. *Prognostikon*
V.M. *On Anc. Med.*

HIPPOLYTUS

Ref. *Refutatio omnium hæresium*

HOMER

Il. *Iliad*
Od. *Odyssey*

HYPEREIDES

Eux. *Pro Euxenippo*

IAMBlichus

Vita. Pyth./V.P. *De vita Pythagorica*

ISOCRATES

Adv. soph. *Adversus sophistas*
Ant. *Antidosis*
Areop. *Areopagiticus*
Panath. *Panathenaicus*

LYCURGUS

Leocr. *Against Leocrates*
Lyc. *Lycurgus*

PHILO

De incorr. mundi *De incorruptibilitate mundi*
Quis rer. div. hæc *Quis rerum divinarum hæc*

PHILOPONUS

Phys. *In Aristotelis Physica commentaria*

PINDAR

I. *Isthmian odes*
N. m. *Nemean odes*
Ol. *Olympian odes*
Pyth. *Pythian odes*

PLATO

I Alc. *Alcibiades I*
Ap. *Apology*
Crat. *Cratylus*
Ep. *Epistulae*
Euthd. *Euthydemus*
Menex. *Menexenus*
Parm. *Parmenides*
Phaedr./Phdr. *Phaedrus*
Phil. *Philabus*
Prot. *Protagoras*
Rep. *Republic*
Soph. *Sophista*
Symp. *Symposium*
Theaet. *Theaetetus*
Tim. *Timaeus*

PLUTARCH

Adv. Colotem (Mor.) *Adversus Colotem*
De commun. notit. (Mor.) *De communibus notitiis versus Stoicos*
De I. (Mor.) *De E. apud Delphos*
De sera num. (Mor.) *De sera numinis vindicta*
Lyc. *Lycurgus*
Mor. *Moralia*
Sol. *Solon*
Strom. (Mor.) *Stromateis*
Vita Alc. *Alcibiades*
Vita Isoc. *Isocrates*
Vita Lys. *Lysander*
Vita Per. *Pericles*
Vitae X Or. (Mor.) *Vitae decem oratorum*

PORPHYRY

De antr. nymph. *De antro nympharum*

PROCLUS

Comm. in Crat. *In Platonis Cratylum commentarii*
Comm. in Eucl. *In primum Euclidis librum commentarii*
Comm. in Parm. *In Platonis Parmenidem commentarii*
Comm. in Rep. *In Platonis Rempublicam commentarii*

ST. AUGUSTINE

*Civ. Dei**De civitate dei*

SENECA

*Ep.**QN**Epistulae**Quaestiones naturales*

SEXTUS EMPIRICUS

*Adv. math.**Pyrrh. hyp.**Adversus mathematicos**Pyrrhōneioi hypotypōseis*

SIMPLICIUS

*Phys.**In Aristotelis Physica commentaria*

SOPHOCLES

*Ant**OC**OT**Antigone**Oedipous Coloneus**Oedipous Tyrannus*

THEMISTIUS

*Phys.**In Aristotelis Physica paraphrasis*

THEOPHRASTUS

*De sens.**Phys. op./Phys. opin.**De sensu**Phusikōn doxai/Physicorum opiniones*

XENOPHON

*(Ps.-) Ath. const., Ath. pol.**Const. Lac.**Mem.**Athenian Constitution (Athēnaiōn politeia)**Spartan Constitution**Memorabilia*

BIBLIOGRAPHIC

Note: Refer to the Bibliography at the end of Volume II for complete documentation of the Vlastos sources.

Allen

R. E. Allen, ed., *Studies in Plato's Metaphysics*. London: Routledge & Kegan Paul, 1965.

Furley and Allen

David J. Furley and R. E. Allen, eds., *Studies in Presocratic Philosophy*. Vol. I (1970), Vol. 2 (1975). London: Routledge & Kegan Paul.

Plato I

Plato II

PS

Vlastos 1971b (*Critical Essays I*)Vlastos 1971c (*Critical Essays II*)

Platonic Studies = Vlastos 1973

SIMP

Socrates, Ironist and Moral Philosopher =
Vlastos 1991

SS

Socratic Studies = Vlastos 1994

SCHOLARLY JOURNALS AND REFERENCE WORKS

AGP

Archiv für Geschichte der Philosophie

AJA

American Journal of Archaeology

AJP

American Journal of Philology

AnAW, AnzAW

*Anzeiger der Akademie der Wissenschaften in
Wien*

CAH

Cambridge Ancient History

CP

Classical Philology

CQ

Classical Quarterly

CRAI

*Comptes rendus des séances de l'Académie
des inscriptions et belles-lettres*

DK

Hermann Diels, *Fragmente der Vorsokratiker*,
ed. Walther Kranz, 3 vols. 6th ed., 1951
(or earlier editions as noted). Dublin and
Zurich: Weidmann.

Dox. Graeci

Diels, *Doxographi Graeci*, Berlin, 1879

Enc. Brit

Encyclopaedia Britannica

GGM, GottNachr

*Nachrichten von der Königlichen Gesellschaft
der Wissenschaften zu Göttingen/der
Akademie der Wissenschaften zu Göttingen*
Inscriptiones Graecae, ed. Prussian Academy
of Sciences, Berlin, 1873

IG

JHP

Journal of the History of Philosophy

JHS

Journal of Hellenic Studies

LSJ

H. G. Liddell and R. Scott, *A Greek-English
Lexicon*, rev. by H. S. Jones and
R. McKenzie, New (9th) ed., 1940.
Oxford: Clarendon Press.

PA.A

*Proceedings of the American Academy of Arts
and Sciences*

PAS

Proceedings of the Aristotelian Society

Phil. Woch.

Philologische Wochenschrift

Philol

*Philologus: Zeitschrift für klassische
Philologie*

PQ

Philosophical Quarterly

PR

Philosophical Review

Proc. Arist. Society

Proceedings of the Aristotelian Society

xxxiv ABBREVIATIONS

RE

*Paulys Realencyclopädie der classischen
Altertumswissenschaft*, rev. by G. Wissowa
et al. Stuttgart, 1893–1978.

REG

Revue des études grecques

Rhein. Mus.

Rheinisches Museum für Philologie

SPAW

*Sitzungsberichte der preussischen Akademie
der Wissenschaften*

TAPA

*Transactions and Proceedings of the American
Philological Association*

MISCELLANEOUS

ad fin.

at the end

ad init.

at the beginning

ad loc.

at the place

apud

cited by/quoted in

et sq.

and the following

per contra

on the contrary

s. c.

namely

sub fin.

before the end

s. v.

under the word

PART ONE

CONCEPT STUDIES

THEOLOGY AND PHILOSOPHY IN EARLY GREEK THOUGHT

WHEN ONE reads the Presocratics with open mind and sensitive ear, one cannot help being struck by the religious note in much of what they say. Few words occur more frequently in their fragments than the term *god*.¹ The style itself in certain contexts is charged with religious associations; the rhythm and sentence structure of certain utterances is unmistakably hymnodic.² In Parmenides and Empedocles the whole doctrine of Being and Nature is put forth as a religious revelation. The major themes of all the *physiologoi*—the creation of the world, the necessity of its order, the origin of life, the nature of the soul, and even such things as the causes of winds, rain, lightning and thunder, rivers, meteorites, eclipses, earthquakes, plagues—were matters of vivid religious import to their contemporaries. Lightning, thunder, a storm, an earthquake were "signs from Zeus" (*diosēmiat*) that could stop a meeting of the Law Courts or of the Assembly,³ religious feeling for an eclipse could overrule military intelligence to cause the greatest disaster ever suffered by Athenian arms.⁴ The philosophers who took the "natural" view of these things could not be indifferent to the religious bearing of their conclusions. To think of them [97] as mere naturalists, bracketing off their speculations from religious belief and feeling, would be to take a very anachronistic view of their thought.

Now it is just this view that was upheld quite belligerently by Burnet,⁵ whose *Early Greek Philosophy* has gone through four editions since its first

From *PQ* 2 (1952) 97-123, used by permission. Reprinted in Furley-Allen I, pp. 92-129. Minor corrections have been made.

¹ See the word-index in DK (all subsequent citations of pre-Socratic fragments refer to this work). s.v. *theos*: eight columns of listings, against six for *physis*, less than six for *kosmos*.

² See I. J. Nørdén *Agnostos Theos*, Leipzig, 1913, p. 164, K. Deichgräber, "Hymnische Elemente in der philosophischen Prosa der Vorsokratiker," *Philologus* 88 (1933); and now W. Jaeger, *Theology of the Early Greek Philosophers*, Oxford, 1947, *passim*.

³ For the evidence see, e.g., O. Gilbert, *The Constitutional Antiquities of Sparta and Athens* (Eng. tr., London, 1895, p. 292, nn. 3 and 5).

⁴ Thuc. 7.50.4.

⁵ In a good cause: he was combating the error, then prevalent in some quarters, "of deriving science from mythology" (p. 14).

publication in 1892 to become the most influential guide to the study of the origins of Greek thought in the English-speaking world. Burnet explained away the term *god* in the pre-Socratics as a "non-religious use of the word" (p. 14), and though perhaps he never thought through the meaning of this remarkable expression, the general point of his contention is clear enough. Like many a god and goddess in Hesiod, he argued, the "gods" of the philosophers are not "objects of worship" but "mere personifications" of natural phenomena. Now it is true that the *physiologoi* maintained in all their thinking a singular independence from the public cult. If this were all that Burnet had in mind, his contention would be not only true but, as I shall argue shortly, absolutely fundamental to the proper understanding of their religious ideas. But Burnet went far beyond this when he claimed that they themselves attached no religious import to those ideas which they proclaimed in open or tacit defiance of the prevailing faith. It is true, of course, that their primary object is to understand nature, not to reform religion. When they discuss religious concepts, they are generally content to leave religious practices alone. But even this statement has important exceptions, and though one of them fits Burnet's thesis, the rest go dead against it.

In Empedocles it is the mystic, not the *physiologos*, who is exercised about the cult. His heart-wringing appeals for a religion undefiled by animal sacrifices and the eating of beans are inspired by the Orphic piety of his *Purifications* which admits of no rational connection with the scientific temper and doctrine of his work *On Nature*.⁶ But in Xenophanes we find something quite different. When he calls nature "God,"⁷ he is asserting no "mere" personification, but a doctrine which has urgent religious relevance, since it prompts him to attack the traditional beliefs as both irrational and irreverent.⁸ It is impious, he says in effect, to speak about the gods [98] as Homer and Hesiod do,

⁶ See below, Section V. On the relation of Empedocles' *Purifications* to Orphism, see, e.g., W. Kranz, "Vorsokratisches III," *Hermes* 70 (1935) at pp. 112-15.

⁷ Aristotle, *Met.* 986b24, "looking at the whole *ouranos*, the One, he said, is god."

⁸ B 1.13-14, "Pious (*euphronas*) men must first hymn god with reverent (*euphēmois*) myths and pure words." Which myths he considered reverent is clear from lines 21-23 of this fragment and B11, B12. My translation of *euphronas* differs from the usual renderings ("joyful" in Burnet, *Early Greek Philosophy*, and Kathleen Freeman's *Ancilla to the Presocratic Philosophers* [Oxford: Blackwell, 1956]) but is justified both by the context and by such usage as in Aeschylus, *Choephoroi* 88: τὸς εὐφρον εἴπω, πὸς ζατεῖ' ἔοικα εὐφρονος ἀσπίδος, "good omen" (LSJ, s.v.). Here, as in the following "pure" (*katharists*), Xenophanes is reinterpreting current religious terms, transposing them into the framework of his own rational religious beliefs. The word *god* in the citation is not necessarily the One God of his philosophy of nature. As Grube observes in another context (review of Jaeger's *Paidea* in *AJP* 78 [1947], p. 211n.17), "*ho theos* no more implies the existence of one God than *ho anthropos* the existence of only one man. . . . Both are generic." This is quite clear here, since the fragment shifts to "gods" in line 24. The relation between the "One God" and the many "gods" in Xenophanes is obscure. All we can get from the fragments is that the moral, nonanthropomorphic properties of the "One God" are normative for the "gods" as well.

implying that *his* doctrine sets general standards for pious utterance. Heraclitus goes much further when he blasts away not only at what people say about the gods, but at what they do in their most sacred rites.⁹ Such modes of worship offend not only his reason but his religious sense; they are not only "madness" (B5, B16) but sacrilegious madness, "unholy mysteries" (B14). There is a strong implication here that there can and ought to be a different form of worship which would qualify as "holy"; and this is confirmed by a passage in Iamblichus: "I distinguish two kinds of sacrifice: first, those of the completely purified, such as would happen rarely with a single individual, as Heraclitus says, or with a handful of men, secondly, the material . . ."¹⁰ We need not take this as a wilful preference for solitary worship. It is more likely an expression of Heraclitus's despair of the capacity of the "many" to understand what he was talking about and to act accordingly. In any case, it is clear that the "divinity" of his World Order¹¹ is seriously meant as a genuine religious object that *could* be worshiped by the enlightened.

Nor will Burnet's appeal to Hesiod support his thesis. Certainly many divinities of the *Theogony* were not worshiped; but the same could be said of scores of figures in the traditional mythology which no one would term "non-religious." A Greek might know of no local cult to Sun or Moon and might even think with Aristophanes¹² that none existed throughout the whole of Greece—and still be outraged by a denial of their *bona fide* divinity.¹³ Certainly, too, many of Hesiod's figures are personifications of natural or human phenomena, but to say they are "mere" personifications is to confuse the issue. What is there more typical of Greek religion than the personification of winds, springs, rivers, earth, season, graces, love, victory, justice, peace, etc.—whose religious vitality is attested in the cult?¹⁴ It is not Hesiod's verse that personifies everything from Lightning and Thunder to Sleep and Fear and Rancor, but the religious attitude of his people which feels the world as the theater of supernatural and superhuman forces. When Hesiod fills out the divine genealogies with innumerable [99] persons, some of whom doubtless never figured in earlier mythology, he is simply pursuing the logic of this

⁹ Attacks on purificatory rites and on image-worship, B5, on the mystery cults, especially those of Demeter and Dionysus, B14-B15. [In B 92 I follow H. Fraenkel in ascribing on γ the words *Νύξ* and *Μενομένη* to Heraclitus: "raving" (*maneshaia*) is the antithesis of Heraclitean *logos*, *sophia*, and is used in his denunciation of mystic rites at B15. Diels's (and the usual) editing of this fragment would make the raving Sibyl the prototype of Heraclitean wisdom!]

¹⁰ B69, omitted in Burnet [as W. K. C. Guthrie observes, *Orpheus and Greek Religion* (London, 1935), p. 230.]

¹¹ B67, B102, B114, and see H. Fraenkel, "Heraclitus on God," *TAPA* 69 (1938), pp. 230-44.

¹² *Peace* 406ff.

¹³ Cf. the decree of Diopenthes, Plutarch *Pericles* 32, and Plato *Ap.* 26c.

¹⁴ See F. R. Farnell, *Cults of the Greek States* (London, 1909), Vol. 5, Chapter 11 and notes.

¹⁵ Aristophanes jokes—pour a libation to Stupidity (*Knights* 221)—he is not even laughing at the idea of him, he is just taking it for granted.

animistic view of nature and life. They all belong to the same "race" as the gods of the cult, they all have some share, great or small, of that mysterious power which exalts divine beings above the rigid limits of natural necessity.¹⁵

And this is precisely what, on any theory, Heraclitus (for example) did *not* mean, when he called his World Unity "god." What then *did* he mean? Burnet's theory stops him from so much as asking the question and leaves him with a blind spot for that part of pre-Socratic thought which is its unique contribution to religion. Thus he can see no more in Xenophanes than a denial of "the existence of any gods in the proper sense"; the words "One god" mean "No god but the world" (p. 128). The result has the effect of a distortion. It turns the pre-Socratics into purely "scientific" thinkers, ignoring the fact that, for better or for worse, their "science" was far more (and less) than science, in our sense, has any business to be.¹⁶ Doubtless their concept of nature as a self-enclosed, self-regulative system is the intellectual foundation of science, and they who built it out of incredibly inadequate materials have every right to be considered pioneers of the scientific spirit. But neither can we forget on this account that those who discovered this concept of nature believed that they found in it not only the principles of physical explanation, but also the key to the right ordering of human life and the answer to the problem of destiny. They began with the faith that nature itself was animated¹⁷ by that Wisdom and Justice which the most enlightened conscience of their race had imputed to Zeus. So long as this faith lived, they could transfer to nature the reverence hitherto reserved for Zeus and could therefore call nature "god" without indulging in an empty figure of speech. [100]

¹⁵ See below, n. 90; and cf. E. Ehnmark, *The Idea of God in Homer* (Upsala, 1935), p. 11: "the criterion of divine power is its supernatural power." Jaeger (above, n. 2) holds that Hesiod's gods "are really subject to what we should call natural law . . . because they have all been 'generated by the mighty power of Eros.' The premise goes a long way beyond anything in the *Theogony*, where Eros gets five lines altogether (120-23, 201-2). But even if we choose to read the potency of Eros into every "birth" in the *Theogony*, we are still a long way from 'natural law,' in a realm where the natural pattern of sexual generation can be broken *ad libitum* without occasioning the slightest surprise, as, e.g., in the birth of Athena, or the birth of Erinyes, Giants, Nymphs, and Aphrodite (183ff.), to say nothing of the (presumably asexual) generation of the originals, Chaos, Earth, Eros himself, and Night.

¹⁶ This is recognized by Burnet himself in a remarkable passage. In *Greek Philosophy* (London, 1914), pp. 11-12, he notes that Greek philosophy "is dominated from beginning to end by the problem of reality (*to on*)," a problem "which at once takes us beyond science" and adds: "Greek philosophy is based on the faith that reality is divine . . . It was in truth an effort to satisfy what we call the religious instinct. Here is impressive evidence that the vision of this great scholar was not blinkered by his theory. Had he pursued this line of thought, he would have forestalled my objections. Unfortunately he did not: on p. 29 of this later book he repeats, almost verbatim, the statements made many years before in *Early Greek Philosophy*, which I have criticized here.

¹⁷ I use the word advisedly. See my "Equality and Justice in Early Greek Cosmologies," *CP* 42 (1947), p. 177 and notes (** 187 and nn.)

There is a kind of poetic justice in the fact that Professor Jaeger's *Theology of the Early Greek Philosophers* should have been delivered as the Gifford Lectures (1936) at St. Andrews, where Burnet had held for many years the chair in Greek. It is not polemical in tone, and there is no mention of Burnet except at incidental points where Jaeger agrees with him as often as not. But it is doubtless the strongest reply Burnet's thesis has yet received,¹⁸ and it is all the more telling for keeping clear of the fanciful speculations that marred earlier statements of the antithesis.¹⁹ It works with the sound methodological principle that pre-Socratic philosophy is generally marked by close-knit coherence and should therefore be studied "as an indivisible organism, never considering the theological components apart from the physical or ontological" (p. 7). Coming as it does from one of the foremost living students of Greek thought, it cannot fail to command attention. It will remain for years to come one of the "standard" books with which every student of the pre-Socratics will have to deal. Such a work does not lend itself to summary and does not need it. The many insights by which it illuminates and enriches our understanding of the first chapter of Western philosophy can best be appreciated by those who will read the book as a whole, with the leisureliness and care it invites and deserves. I shall therefore forgo here any thought of surveying its positive contributions and keep to a more limited and somewhat invidious task. I wish to discuss briefly those aspects of the author's thesis which strike me as open to grave objection. The critical tone of my remarks will not be misunderstood, I hope, as any reflection on the solid value of the work.²⁰ It is merely incidental to the expression and documentation of an alternative point of view which agrees with Jaeger against Burnet about the authenticity of the religious component in pre-Socratic thought but prefers to interpret it along somewhat different lines.

My main question springs out of the very use of the word *theology* both in

¹⁸ For a sample of the clash, compare their views of Xenophanes. Burnet: "He would have seemed to be well known that one day he was to be regarded as a theologian" (*Early Greek Philosophy*, p. 129); Jaeger: "only as a theologian can he be really understood" (p. 49).

¹⁹ I am thinking particularly of K. Joël's *Der Ursprung der Naturphilosophie aus dem Geiste der Mysterien* (Jena, 1906) whose title tells its own tale, and F. M. Cornford's *From Religion to Philosophy* (London, 1913), the early work of a great scholar which overworks the hypothesis that the categories of Greek philosophy were "already implicit" in Greek mythology, and which is further weakened by uncritical borrowings from the then fashionable school of French sociology. It remains for all its faults a valuable, suggestive study.

One's best testimony to the value of the work of a serious scholar is to take it seriously, either by way of assimilation or else by way of criticism where one is compelled to disagree. The former I have done repeatedly in earlier published work, expressing my personal indebtedness to Jaeger for many things I have learned from him, and will do so again both in this paper and hereafter.

the title and constantly throughout the book as a description of the religious ideas of the pre-Socratics. The word, of course, means no more than "account of god" and could be so applied to any doctrine of divinity. But the historian of ideas must scruple to use fundamental terms [101] without regard to their exact historical fitness. He must ask himself in this connection: Would the *physiologoi* themselves have used the word of their own speculations about divinity? We know that Aristotle so terms his metaphysics *qua* science of divinity²¹ and may assume that Plato would not be averse to have his arguments about the existence and providence of the gods described as theology²². But we also know that neither Aristotle nor Plato assumed so much for the natural philosophers who preceded them. As Jaeger observes of Aristotle, "in historical contexts . . . he used the term to designate certain non-philosophers such as Hesiod and Pherecydes, whom he contrasts sharply with the oldest genuine philosophers or physicists".²³ and Plato's practice is quite similar.²⁴ The basis of the contrast in Aristotle's mind seems to be mainly that the

²¹ *Met.* 1026a19, 1064b3.

²² Jaeger holds that the very word *theologia* was coined by Plato (and adds, here unconsciously controverting the major thesis of his own book, "and he [Plato] evidently was the creator of the idea," p. 4). But Plato is a fastidious linguist. When he makes up a word, he is very self-conscious about it (e.g., at *Theaet.* 182a). There is no hint of terminological innovation at *Rep.* 379a; the word is introduced by Adeimantus (not Socrates) as a variant for "tales about the gods":

SOCRATES: The founders ought to know the canons (*typous*) in accordance with which the poets should tell their stories (*mythologein*) [*sc.*, about the gods] . . .

ADEIMANTUS: What then are the canons for stories [or, accounts] about the gods (*typoi peri theologias*)?

The casualness with which the word is used here (and, curiously enough, never again in Plato in contexts such as *Laws* X where we should most expect it had it been "coined" to indicate "the importance from Plato's point of view of the mental attitude which it tries to express," Jaeger, *Theology of the Early Greek Philosophers*, p. 194) suggests that it was in common use at the time. And I see no good reason for doubting that those who "spoke about the gods" (*hoi legontes peri theōn*, Plato, *Laws* 886c, of the theonists, cf. Empedocles B 131, *amphi theōn* . . . *logon*, of his own theogony) would be referred to as *theologoi* long before this time, similar compounds with *-logos* such as *chresmologos*, *meteorologos*, occur in fifth-century texts; Philolaos B8, if genuine, would settle the point. Whether *theologia* was used as the title of any of the sixth-century theogonies (as Diels assumes, e.g., in the case of Pherecydes) is a different, and secondary, question, which cannot be settled from the available evidence.

²³ He adds a little further: "Eudemus [of Rhodes, the first writer of a history of theology] would never have included his master Aristotle, the creator of metaphysics or theology in the philosophical sense, among the theologians," p. 5; still less would he have included Anaximander or Anaxagoras.

²⁴ At *Laws* X. 886d he distinguishes between (a) those who "speak about the gods" and propound "theogonies" and (b) those "recent wise men" (*neōn kai sophōn*) whose cosmology is materialistic, further identified later at 891c as "all the men who have undertaken natural investigation." The distinction, assumed at the beginning, is rigorously observed in the body of the ensuing argument, which explicitly ignores the former (886d) to concentrate on the refutation of the latter (886e ff.).

theologians talk myth, while the philosophers speak the rational language of natural inquiry. Jaeger would then seem to be on safe ground in taking this over, and so juxtaposing to the mythical theology of the older poets the rational or natural theology of the philosophers. But Aristotle never talks that way. As a *historical* term, "theology" for him (and for his school) has a clearly marked denotation which excludes the *physiologoi*. Why so? The answer is not to be found in Aristotle, who never stopped to analyze the problem.²⁵ We can get at it only by looking at the actual work of the theologians themselves, beginning [102] with Hesiod, whose fully preserved text and well-known impact on Greek thought gives us our best basis for judgment.

When Herodotus (2.53.2) speaks of those who "composed a theogony for the Greeks and gave the gods their names and divided their honors and occupations and designated their forms," he gives pride of place to Hesiod.²⁶ His very wording here echoes the *Theogony*: "Tell how at the first the gods and earth came to be. . . and how they divided their wealth and shared their honors."²⁷ The gods Herodotus is thinking about are quite specifically the gods of Greek worship. Hesiod's range is broader. It takes in gods whose connection with the cult is marginal, indeterminate, or wholly nonexistent. But the ultimate concern of the *Theogony* is with the major deities of the cult, "the gods, givers of good things."²⁸ The great drama of the *Theogony* turns on the "struggle for honors"²⁹ between Titans and Olympians. It tells how the former lost to the latter just that "wealth" and "honor" whose possessors qualify as cult gods by virtue of having "good things" to give to those who honor them with sacrifice, libation, and prayer.

There is no need to slight in this connection the cosmogonic and cosmological interests of the *Theogony*. An adventurous mind could hardly inquire into the origin of the gods without passing over into the kindred question of the origin of the world. This would come all the more naturally to one who thinks, as Hesiod does, of the four main articulations of nature, Earth, Sky, Sea, and Night, as themselves divine beings, whose generation accounts at

²⁵ Neither did Plato. But his practice comes much closer to what, I shall argue, is the real difference, taking it for granted that the theologians are talking about the gods of the cult (cf. *Tim.* 40d-41a) while the *physiologoi* are either downright atheists or else deny (the primary assumption of the cult) that the gods "care for human affairs" (886e).

²⁶ An earlier testimony of the crucial role ascribed by the Greeks to Homer and Hesiod in the shaping of the popular creed comes from Xenophanes, who makes them the main butt of his attacks (B11, B12).

²⁷ 108ff. I follow Solmsen (*Hesiod und Aeschylus*, Ithaca, 1949, p. 8n. 7) in accepting the genuineness of vv. 111-14. For "honor," "gift" (*timē*, *geras*, *dōron*), "lot," (*moira*) among the gods, see also verses 74, 204, 393-99, 413, 882, 885.

²⁸ Verses 46, 111; also 633 and 644 where the "givers of good things" are clearly identified with the Olympian faction.

²⁹ Verse 882. In Homer (*Il.* 15.165ff.) the "lots" and "honors" of the gods are fixed by primordial *moira*. In Hesiod they have to be fought for and apportioned as spoils of war.

one stroke for both the origin of the physical universe and the generation of the whole "race" of the gods. Thus theogony broadens out easily into cosmogony and even passes at times into pure cosmology, as in the famous description of the geography of the universe (720ff.), with equidistant intervals from Sky to Earth and from Earth to Tartarus, and its remarkable account of the "sources and limits" in Chaos of Earth, Sky, Sea, and Tartarus (736ff.) One may recognize all this and still assert that the great bulk of the epic is not cosmology or cosmogony, but theogony and theology.³⁰ Its primary purpose is twofold: first, to sort out the motley mass of divinities, both the ones that Hesiod found ready-made in cult and those added by his own inspired fancy, into well-defined stems of descent; and second, to vindicate the reigning order among the gods. The latter not only establishes the supremacy of the gods of the cult over all the rest [103] but ends the quarrelsome anarchy of the Homeric pantheon and assures law and order on Olympus under the stem authority of Zeus. Hesiod's audience is now assured that each cult god has and keeps his proper province, so that each may be worshiped without risking offence to his peers and thus causing more trouble than he is worth.

This is what makes Hesiod's work a theology in a sense which cannot, by any stretch, take in the *physiologoi*. It is not merely that his forms of thought are mythical, his standards of rationality more primitive, his conclusions more traditional than theirs. All these things are true but do not get at the heart of the difference, which is just this: The divinity of the *physiologoi* has no direct connection with the public cult and is indeed so independent of it as to leave the very existence of the cult gods in doubt and expose the most sacred ritualistic acts to Heraclitus's scornful rejection.³¹ Hesiod's teaching of divinity, on the other hand, puts the objects of the public cult at its center. The information it conveys and the assurance it offers about the divine order makes the acts of the cult sensible propositions to a thrifty, calculating, peace-loving worshiper, such as Hesiod himself and the rural public to which he spoke.³² What the "Greeks" got from his *Theogony*—not later philosophers, like Aris-

³⁰ Cf. Solmsen, *Hesiod and Aeschylus*, p. 58: "It is wrong to call the *Theogony* a cosmogonic poem"; {and p. 104n.6: while the Presocratics "are anxious to find a condition of *dikē* and *eunomia* in the world of the physical elements, . . . Hesiod had restricted these 'ideas' to the dispensation of Zeus and to human society. In this important respect the Presocratics may be said to have destroyed the Hesiodic pattern."}

³¹ The average man would at least gather from the teaching of the *physiologoi* that it makes the worship of the traditional gods perfectly pointless. Cf. the reaction of Strepsiades (*Clouds* 425-26), when converted to the new philosophical divinities: "I absolutely will not talk to the other gods, not even if I run into them on the street; I will not sacrifice, nor pour libations, nor offer frankincense to them."

³² Hesiod's work is not, of course, apologetics for the cult, none would be needed where no doubt of its validity has yet arisen. But when he comes across a specific feature of the cult which must have struck him and his hearers as decidedly queer, he is ready to explain away the difficulty with an aetiological myth: verses 533ff., and Solmsen, *Hesiod and Aeschylus*, pp. 48-49, for the interpretation of the Prometheus story as an aetiological myth.

totle, who regarded it so patronizingly as uncouth, archaic cosmology, but the people at large who read it as a religious text—was a creditable and satisfying account of the gods they worshiped

III

It is just this relation to the public cult that Jaeger ignores in his account of Hesiod's theology³³ and systematically belittles when he gets to the theogonies which are contemporary with the first generations of pre-Socratic philosophy. His thesis here is that these "theogonic writers cannot be understood except in the light of their close reciprocal relationships with the philosophers of their own period" (p. 57). Now we do not know what influence, if any, these theogonies had on the philosophers, nor does Jaeger profess to tell us.³⁴ Nor is there any evidence of philosophical influence [104] on any of the theogonies prior to that of Pherecydes.³⁵ With this one exception, all that remains of their "close reciprocal relationships" with the philosophers is that they dealt with the common problem of the origin of the world, the nature of the gods, the destiny of man. But their attack on these problems is decidedly different. Is the difference merely that they tell myths, while the philosophers

³³ Though not in *Paideia* (Vol. I, 2nd Eng. ed., New York, 1945, p. 65), where he was not preoccupied with the thesis of the present book.

³⁴ Reconstructions of such influence are not lacking in the literature. With the single exception of the influence of Orphism on Pythagoreanism, they are wholly conjectural and amount to nothing more than the detection of certain supposed resemblances between the theological and philosophical cosmogonies. For the best statement of this point of view, see Guthrie, *Orpheus and Greek Religion*, Chapter 7. I can only record the impression that the ingenious "parallelisms" that are traced here between, say, Anaximander and the Orphic cosmogony are (a) unconvincing at such points as the alleged correspondence between a supposed *gōnimon* in Anaximander and the Orphic Egg or between Anaximander's Moist and the Orphic Eros and (b) constitute no proof of an "indefinite impression" which the Orphic theogony is here (p. 224) said to have made on Anaximander and cannot even be taken as evidence of Anaximander's acquaintance with this cosmogony. If we would generalize from the fragments of Xenophanes and Heraclitus, we would have to say that Ionian philosophy ignores the sixth-century theogonies. Xenophanes makes Heraclitus of Hesiod the butt of his poem against the poets (above, n. 26). Heraclitus inveighs at the same pair but names also Xenophanes, Hecataeus, and Archilochus (B4d), B42, B56, B101, B105, B170; neither of them mentions Orpheus or Musaeus or any of the rest except Pherecydes, who is mentioned by Xenophanes as having lived 154 years (B20).

Nothing in Jaeger (*Theology*) to this effect except for (a) the conjecture that the two Titans in Pherecydes B5 are Oceanus and Tethys, followed by the farther conjecture, "possibly the philosophers," and (b) the assertion that "as in the older [sic] Pythagorean philosophy, Air [in Epimenides B5] is thought as the void" (p. 65). (a) needs no comment. As for (b), there is no evidence in the text that air is thought as the void, nor if there were would it be chronologically plausible to infer Pythagorean influence on a sixth-century theogony, but perhaps Jaeger's statement is not intended as assertion of philosophical influence, which would then reduce the "close" influence of philosophy on the theogonies prior to Pherecydes to the compound conjecture in (a).

do not? If that were all, Jaeger might be justified in treating them as a halfway house between Hesiod and Ionian *physiologia*. But in so doing he misses—ignores or explains away³⁶—the remarkable fact that these theologies are one and all ascribed to men who, as historical or legendary characters, were leading figures in the new religious movements and activities of the time. Orpheus is the founder of mystic rites par excellence;³⁷ so is Musaeus, and also a patron of cathartic medicine.³⁸ Of the historical figures Epimenides is the famous purifier of Athens, prophet, founder of shrines;³⁹ Onomacritus a no less famous expert in [105] oracles;⁴⁰ Pherecydes' religious ventures are obscure, but we do know his reputation as a wonder-worker.⁴¹ Is it likely that theogonic writings would be imputed to such figures if there were no connection between the religious speculations contained in these works and the religious enterprises of their reputed authors?

The only way we can account for both the unprecedented proliferation of such a literature and the peculiar authority attached to it by the sectaries of the new cults⁴² is to consider how urgently the sponsors of new rites would need to explain and justify their meaning over against the massive authority of the traditional ceremonials sanctioned by long-established usage. Thus the new worship of Dionysus produced "sacred tales" (*hieroi logoi*) which "explained"

³⁶ On the ground (p. 60) that the nominal authorship is frequently demonstrably false. But what matters here is (a) the fact (not the veracity) of the ascription and (b) the use to which these writings were put, as, e.g., by Orphic sectaries, prophets, and priests (Eur. *Hippol.* 925–27, Plato *Rep.* 364e and *Meno* 81a–c).

³⁷ Eur. *Rhesus* 943–44, "Orpheus taught her [Athens] the torch-processions of mystic rites"; Aristoph. *Frogs* 1032–33, "Orpheus taught us mystic rites and to abstain from slaughter; Musaeus the healings of diseases and oracles"; Plato *Prot.* 361d [ancient "sophists" assumed various guises, one of them being that of] "those occupied mystic rites and oracles, followers of Orpheus and Musaeus"; Ephorus *apud* Diod. 5.64.4: "He was the first to introduce mystic rites to the Greeks." For the interpretation, see especially Linforth *The Arts of Orpheus* (Berkeley 1931), pp. 291ff. Jaeger's remark (*Theology*, p. 60), "He [Orpheus] was not a specifically religious figure but rather a mystical singer of primeval times," seems to me to pose a false contrast. Orpheus was both singer and religious figure; one could refer to him *qua* singer; but is there any instance where a theological doctrine would be referred to him *qua* mere singer? Jaeger himself assumes without question a little later that the account of the soul in the "so-called Orphic poems" (Arist., *De an.* 410b22ff.) is "Orphic" in the specifically religious sense of the word.

³⁸ A glance at the fragments in DK will show how persistently he is associated with the foundation of mystic rites, especially those of Eleusis. On his association with religious (purificatory) healing, Aristoph. *Frogs* 1033 is decisive.

³⁹ See the fragments in DK.

⁴⁰ Herodotus 7.6, "a *chrēsmologos* who set in order the oracles of Musaeus." I do not know why Diels-Kranz do not include his fragments among those of the theogonists; see the relevant testimonies in Kern, *Orphicorum Fragmenta*, Berlin, 1922, pp. 55–56, and for the interpretation, M. P. Nilsson, "Orphism and Kindred Movements," *Harvard Theological Review* 28 (1935) at pp. 195–98.

⁴¹ Arist. frag. 191 Rose says of Pythagoras: "and he did not hold back from Pherecydes' miracle-mongering." Theopompus' *Mirabilia* included a section on Pherecydes (Pherec. A1 and A6).

⁴² Eur. *Hippol.* 954.

to the Greeks "both the name of Dionysus and the sacrifice and the procession of the phallus."⁴³ A similar function was served by the tales which expounded the Orphic belief in reincarnation: the Platonic Socrates says he heard them from "men and women wise in things divine" whom he identifies expressly as "priests and priestesses who have made it their business to give an account of the matters with which they are occupied."⁴⁴ Even more instructive, I think, is Plato's account of the itinerant prophets at *Rep.* 364b2; they appeal to Hesiod and Homer for support on some doctrinal generalities; but they produce "a mass of books by Musaeus and Orpheus" as authorities for their *ritual*.⁴⁵ The bond [106] of such a literature with the cult is not only as close as Hesiod's, but closer, since it moves into that area of religious procedure which Hesiod had so largely left alone. But I am not suggesting that we should think of the major theogonies as *ad hoc* fabrications to explain this or that rite. We may certainly credit their authors with vigorous, adventurous minds that would hardly be satisfied with piecemeal aetiologies but would weave their interpretations of particular myths or rites into a far-flung pattern of creation and

⁴³ Herodotus 2.48 3ff. The original explanation Herodotus attributes to the quasi-mythical Melampus who, he thinks, imported the cult from Egypt, but he adds that it was improved by "subsequent wise men (*sophistai*)."⁴⁴ How close the bond between such "sacred tales" (*hieroi logoi*) and the cult might be in certain cases, we learn from another report in Herodotus where the explanatory "sacred tale" appears to be actually incorporated in the mystic rite (2.51.4). (One cannot help comparing in this connection his account of Persian sacrifices [1.132.3] where the recitation of a theogony by a *Mugos* is part of the ritual, this report is now confirmed, I think, by students of early semitic ritual, who show the ceremonial function of Babylonian and Palestinian myths of Creation for the references see Cornford's essay, "A Ritual Basis for Hesiod's *Theogony*" in *The Unwritten Philosophy*, Cambridge, 1950, though Cornford's interpretation of Hesiod along similar lines strikes me as forced). That readings from sacred *bibloi* were a part of the ceremonial in some fourth-century mystic rites is clear from Demosthenes 18.259.

⁴⁴ *Meno* 81a. The importance of this passage was called to my attention by Linforth (above, n. 37), p. 294, whose interpretation I am largely following here.

⁴⁵ [βιβλίον δὲ ὁμαδὸν παρέχονται . . . καθ' ὃς θνητοποιοῦσιν, literally, "they produce a pile of books . . . in accordance with which they perform their ritual" (364e2–5). I follow the common view in taking the *they* of this sentence, to be the "mendicant priests and soothsayers" of 364e5. I am not convinced by Linforth's suggestion (*Orphism*, pp. 90–91) that the subject is the people of the general view introduced at 364a, since the people in question here are obviously Orphists and the general view would be that of the public at large. Incidentally, I believe that Lind and Cornford's rendering for *agartai* "mendicant priests" is correct and clearly supported by the *Etymologicum Magnum* (MS 153) from *agartai* "to collect," *agartai* generally "beggar" (in special cases "begging priest"). P. Boyance, "Platon et les Cathartes Orphiques," *REG* 55 (1942) at p. 258n. 1 firmly insists that there is no ground for taking the word to mean "charlatan, quack," and takes obviously a very harsh view of these people, but he is not contrasting them as bogus Orphists with real Orphics. On the other hand I see no reason to assume that Orphism was in any way a coherent, homogeneous movement, not only was Orphism itself "but one of the many sects of a mystic and cathartic beliefs emerging in the archaic age" (Nilsson, "Orphism," p. 185). There were different currents within it, so that Plato could speak with deep respect of some Orphic technicians in the *Meno* and adopt its doctrine of *soma-soma* (C_{rat.} 400c) in the *Phaedrus*. Socrates feels quite free to vent his scorn on the itinerant soothsayers of the present passage

salvation.⁴⁶ The few surviving fragments attested by good authorities suggest that these theogonies were no less ambitious in scope than Hesiod's epic.⁴⁷ Vast canvasses they must have been, thronged with gods and goddesses, drawing the whole universe into their design, accounting in their own fashion for the origin and nature of gods, world, and men. But somewhere along the line, their story would make good the claim of the religious enterprise favored by those who composed or recited it and undermine, by implication or open attack, the claims of their rivals. Such a hypothesis will account for the known facts. And though the dearth of evidence makes its proof impossible, it can at least be partially documented in fragments of the one theology whose outlines can be reconstructed with some measure of confidence, that of Pherecydes.

Following Aristotle's famous statement that Pherecydes "does not say everything in myths,"⁴⁸ scholars are generally agreed that this comes closer [107] to philosophy than does any of the surviving theogonies.⁴⁹ But does this justify the statement that the names of his cosmogonic deities "are merely a transparent archaistic veil which by no means obscures their purely speculative character"?⁵⁰ Speculative some of them certainly are. But are they "purely" speculative? Have they no definite connection with the cult? This it seems is what Jaeger is concerned to assert, presumably on the ground of

⁴⁶ I hope this will meet Professor Rose's objection ("Theology and Mythology in Aeschylus," *Harvard Theological Review* 39 [1946] at pp. 15-16) that Linforth's view (referred to at n. 44, above) is not "the whole truth." Rose speaks of the theologians as "minds not so radically tempered as to insist on going to the very foundations of the subject, in this case their own religion . . . , taking nothing for granted and arguing from first principles, yet sufficiently alert to ask themselves what the time-honored names, legends, and rites meant" (p. 16). This is perfectly acceptable except that in two respects it would hardly apply to the major theologians who, unlike such poets as Pindar and Aeschylus, (i) *did* go in their own way "to the foundations of the subject" and (ii) were concerned with more than the "time-honored names, legends, and rites" since their data would include new rites, legends, and even (as certainly in Pherecydes) names.

⁴⁷ Fully confirmed in the Anstophanean imitation of Orphic theogony at *Birds* 685ff., which is modeled on Hesiod not only in the scope and style of the theogony but also in the immediately following (709ff.) parody of *Works and Days*; see, e.g., Rogers' notes *ad loc.* The Aristophanean theogony, incidentally, also confirms the general relation of theogony to cult: the birds' claim to world sovereignty having been asserted against Zeus on the ground that they are "more ancient and older than Cronus and Titans and Earth" (467-68) and therefore (562) deserve to be worshipped above the traditional gods, the theogony in due course puts their claim to cosmic priority into the framework of a full-fledged account of creation.

⁴⁸ *Met.* 1091b9. But note that Aristotle does not consider him any less of a "theologian" on this account; he puts him in the same company with the Magi, whose connection with the Persian cult we know from Herodotus (above, n. 43).

⁴⁹ See, e.g., von Fritz in *RE*, s.v. Kathleen Freeman, *Companion to the Pre-Socratic Philosophers* (Oxford, 1946), pp. 36ff.

⁵⁰ Jaeger, *Theology*, p. 72 asserted (in the concluding paragraph of the chapter) of the sixth-century theogonies generally, but intended (I assume) particularly of Pherecydes, since it would apply much less to any of the rest

borrowings from the philosophers. He holds that Pherecydes was influenced by Anaximander in substituting the beginningless, ever-living Zas, for the Hesiodic Zeus, great-grandson of Earth, and also in turning the traditional Cronus into the time-god, *Chronos*.⁵¹ But would these transformations, whatever their debt to philosophy, serve "merely [to] express the recent utterances of speculative thought" (p. 69)? The first thing we are told about Zeus (B1 and B2) is that he gave *Gē* (Earth) as a wedding gift⁵² to *Chthoniē* (another name for Earth, here co-original with Zeus and Chronos) and that thus *Chthoniē* acquired the "name" *Gē*. Now Wilamowitz has pointed out that in Mykonos, hard by Pherecydes' native Syros, there is a cult to *Gē Chthoniē*, whose apparent redundancy would be very properly [108] explained here by Pherecydes' theology: dark, barren *Chthoniē* becomes the multi-colored, fertile Earth when fructified by Zas, the principle of life.⁵³ Here the Hesiodic bestowal of

Jaeger I think has a reasonably good case in deriving Pherecydes' doctrine of the eternity of *Zas* from cosmic deities from Anaximander (*Theology*, pp. 67-68), though we cannot exclude the possibility that such an idea occurred independently to Pherecydes. The case for deriving *Chronos* from Anaximander (p. 68 and notes) seems to me quite another matter. There is simply nothing in Anaximander's system to correspond to Time as a substance, still less a cosmogonic one, and this, I think, should be the decisive consideration in our interpretation of the closing words of Anaximander B 1, *kata ten tou chronou tuxin*, on which Jaeger bases his argument. That these words are a verbatim citation has been questioned in an acute paper by F. Dirlmeier, "Der Satz des Anaximandros," *Rhein. Mus.* 87 (1938), pp. 376-82, whose arguments, though answered in part by K. Deichgräber ("Anaximander von Milet," *Hermes* 75 [1940] at pp. 16-17) make it hazardous to base any argument on the assumption that the words in question are Anaximander's own. Assuming that they are, Jaeger insists that the word *taxis* has the active sense "ordainment" or "decrees" rather than the merely passive sense "order" (*Theology*, p. 35 and notes, also earlier in *Philosophy*, 1st and 2nd English ed., New York, 1945, p. 455, n. 50, a similar view had been taken still earlier by H. Frankel, *Parmenidesstudien, Gott. Nachrichten*, 1930, p. 183). I concede that if *taxis* is in the original fragment it probably had the active sense; but if so, it could only have been a metaphor (for the periodic, cyclical order of "reparation"), part of the "poetic language" to which Theophrastus so pointedly refers in making the citation. It could not be literally true because the idea of Time as an agent issuing ordinances and decrees, has absolutely no place in the system as we know it. I conclude, accordingly, that there is no evidence for Jaeger's insistence that Pherecydes borrowed his *Chronos* from Anaximander, since no one would seriously argue that Pherecydes copied a cosmogonic deity from an incidental metaphor in a physical text. As for the equation of *Chronos* (Cronus) it is not asserted in the fragment but it is in the fragments (A9) and parallels the equations Zeus = Zas and *Gē* = *Chthoniē*, one may perhaps conclude that *Chronos* became Cronus through Zas's intervention, as in the transformation of *Chthoniē* into *Gē*. I agree with Gomperz (*Zur Theogonie des Pherekydes*, *Wiener Studien* 47 [1909] at p. 16n. 6) that Wilamowitz's sententious "Ich halte einen Urgott Zeit im 6. Jahrhundert v. Chr. für einen reinen Scherz" is sheer dogmatism.

⁵¹ Is this *Chthoniē*'s "gift of honor" (*geras* B 1 *touton se tona* B 2)? Various cities claimed the honor of having been Zeus's wedding gift (Acragas, scholiast to Pindar *Ol.* 2.10; Thebes, *Phoen. apud* scholiast to Eur. *Phoen.* 687, both from Zeus to Persephone *eis anakaluptēria*). Pherecydes extends this idea, making the whole earth a wedding-gift to *Chthoniē*. Pherecydes, SPAW Phil. hist. Klasse, 1926, at p. 125 *Der Glaube der Hellenen*, I (Berlin 1931), at p. 210.

"honors" by Zeus to other deities⁵⁴ is merged with the notion of a divine marriage (*hieros gamos*), the prototype both of the Greek marriage-rites and of a solemn fertility-festival, the *hieros gamos*, celebrated in various parts of Greece.⁵⁵ The deities to which the *hieros gamos* is now referred by Pherecydes, including the explicit reference to them of the presentation of the gifts of Unveiling (the *Anakalupteria*) in the nuptial rites,⁵⁶ would surely be more than "purely speculative" entities, mere expressions of "the recent utterances of speculative thought."

As for Cronus, he too is quite different from the Hesiodic figure, since he now fights against the Titans, retains possession of the heavens, and is there crowned king of all.⁵⁷ That Cronus is not, as in Hesiod, Zeus's prisoner in Tartarus, but his honored associate in the upper world, may be asserted on good evidence as Orphic doctrine;⁵⁸ and a fragment of Pherecydes explicitly connects the fight of his Cronus against the Titans with "the mysteries about the Titans and the Giants who are said to have made war on the gods and the [sc. mysteries] in Egypt about Typhon and Horus and Osiris."⁵⁹ Finally we have the testimonies of Pherecydes' teaching about the soul which Jaeger completely ignores — just why, I do not know. Cicero tells us that his doctrine of the eternity of the soul is the first extant in literature; another source, that he

⁵⁴ See above, n.27.

⁵⁵ See L. R. Farnell, *Cults of the Greek States*, I, pp. 184ff. and notes; and W.K.C. Guthrie, *The Greeks and Their Gods* (London, 1950), pp. 53ff.

⁵⁶ B2: "from this arose the custom (*nomos*) among both gods and men." H. J. Rose interprets the presentation of the gifts of Unveiling as "in itself a rite of Union, for to give part of one's property is to give a piece of one's self and therefore a kind of communion with the recipient" and adds that traces of the Unveiling-rite still survive in the marriage-rites in modern Chios (*Ancient Greek Religion*, (London: Hutchinson's University Library, 1948), pp. 33 and 146).

⁵⁷ B4. The leader of the Titans is now Ophioneus, an obscure figure in Greek mythology, but mentioned also (as Ophion) in the theogony sung by Orpheus in Apollonius Rhodius *Argon.* I, 496ff. (= Orpheus B16 in DK), as "holding sway on snowy Olympus" before he was expelled by the might of Cronus and "fell into the waves of the Ocean."

⁵⁸ It occurs in one of our earliest and best sources of Orphic belief, Pindar's *Second Olympian* ode (cf. also *Pvth.* 4.291). It is implied at v. 70, where the souls of the just "pass by the highway of Zeus unto the tower of Cronus." The life of the just here (verses 62ff.) "not vexing the soil with the might of their hands, nor the water of the sea, to gain a meagre livelihood" is pictured quite obviously as that of the "age of Cronus" (Hesiod *Op.* 111ff.), no longer a remote antiquity, as in Hesiod, but a perpetual present in the isles of the Blest. (Hesiod, *Op.* 169ff. ed. Rzach, where Cronus, reconciled with Zeus, reigns over the Isles of the Blest, is generally recognized as a later interpolation: see Solmsen, *Hesiod and Aeschylus*, p. 156n.142).

⁵⁹ B4. The "mysteries about the Titans and the Giants" must be Dionysiac and/or Orphic (Paus. 8.37.5, "Taking the name of the Titans from Homer, Onomacritus both composed rites to Dionysus and made the Titans the perpetrators of the sufferings of Dionysus"). For the connection of Dionysiac and Orphic rites, see Nilsson, "Orphism and Kindred Movements," pp. 202ff. The reference to the Egyptian rites is to be understood in the light of the widespread Greek belief that various Greek divinities and rites, especially Dionysiac and Orphic, came from Egypt; see, e.g., Herodotus 2.48 (n.43, above), and Hecataeus of Abdera *apud* Didorus 1.23 and 1.96, the latter including the statement that "the rites of Osiris and Dionysus are the same."

believed in transmigration; a third [109], that he taught that duality of heavenly and earthly elements in the soul which would be, on any theory, the most obvious corollary to the belief in transmigration.⁶⁰ This dualistic conception of man would match and would doubtless be connected in his theology with the "original [Zeus-Chthoniē] dualism" which Jaeger rightly finds "the distinguishing feature of Pherecydes' theory" (p. 69).

The same belief in transmigration and in a dualistic conception of the world recurs in Pythagoreanism, whose founder is presented by so many of our sources as the junior associate of Pherecydes.⁶¹ Here for the first time we find a chapter of pre-Socratic philosophy which can be confidently classed as a theology, since its ultimate data were the hopes, rites, and tabus that centered about the doctrine of transmigration.⁶² Like Epimenides, [110] Onomacritus,

⁶⁰ Listed under A2 and A5 in DK; fragments B6 and B8 also bear on his doctrine of immortality. The heavenly and earthly parts of the "soul" (Aponius in A5) is probably a reference to the dual nature of man's life, whose mortal part is earth and returns to earth, while its immortal part is heavenly or "aethereal" and returns to its heavenly source. There are many fifth century instances of this belief, some of them listed in Gomperz, *Zur Theogonie des Pherekydes*, p. 24n.18, also Pindar frag. 131: the "body of all men is subject to over-mastering death," but the *eidolon*, which "alone comes from the gods" remains alive (a clear reference to mystic faith, since the first line mentions the "rite that releaseth from toil"); also in the well-known Orphic tablets from Petelin (n.11, earlier than Crete), B 17 and 17a in DK: "I am the son of Earth and starry Heaven."

⁶¹ The references in W. Rathmann, *Quaestiones Pythagorae, Orphicae, Empedocleae*, diss. Halle, 1933, p. 12n.10.

⁶² In his remarkably learned dissertation (cited in the preceding note), Rathmann has taken it upon himself to dispute the general view that transmigration was certainly taught by Pythagoras. His arguments on this score are completely unconvincing. Thus Dicaearchus' testimony is not discredited (as he suggests, pp. 3ff.) but on the contrary greatly strengthened by his personal disbelief in immortality and tendency to assimilate Pythagoras to his own preference for the "physical life." Rathmann offers no good reason to doubt the reference of Xenophanes B7 to Pythagoras in Diog. Laert. 8.36 (see W. Kranz, "Vorsokratisches II," *Hermes* 69 [1934], at p. 226-27) which is conclusive contemporary testimony to Pythagoras' belief in transmigration.

A more serious argument which has swayed Nilsson is drawn from the conflicts in the testimonies concerning Pythagorean abstinence from flesh, "some speaking of a general prohibition of certain parts of the animal or certain animals, e.g., the matrix, the heart, the brain, the sea-food, especially of such animals as were not sacrificed. If the general prohibition against all living beings dedicating their flesh existed originally among the Pythagoreans, these special prohibitions would be meaningless," and if the general prohibition was not original, the belief in transmigration could not have been original either (Nilsson, "Orphism and Kindred Movements," p. 106). This leads Nilsson to think that the belief in transmigration came later, under Orphic influence. But surely the conflict of our testimonies on this point can be explained in other ways.

We know that there were different grades of membership in the Pythagorean order, and there are many reports in our sources that the rules for the lower grade (the *akousmatikon*) were (as we would expect) less stringent than for the inner circle not only in other matters such as the sharing of property (see contrast of *koinonion* with *akousmatikon* in Iambli. *Vita Pvth.* 29-30, and cf. *ibid.* 81-82) and doctrinal proficiency (*ibid.* 81 and 87ff.) but also quite specifically for the observance of the ritual and dietary tabus (*ibid.* 108-9-150). Nilsson objects (*Geschichte der griechischen Religion*, I, Munich, 1941, p. 666n.8) that this relaxation of the discipline assumes that the distinction in grades of membership had been established in Pythagoras' own lifetime. But (1) I see

and Pherecydes, Pythagoras was a religious sage: what is more, he is known to have founded a coherent religious sect.⁶³ In our best and earliest sources, we hear even more of his religious activities than of his philosophy.⁶⁴ Herodotus mentions the Pythagoreans only to refer to the peculiar rites they shared with the Orphics.⁶⁵ Plato mentions his name only to speak of him as the founder of what was "still the Pythagorean mode of life";⁶⁶ Isocrates, to say that he was distinguished for wisdom in "sacrifices and religious rites" as much as "in the rest of philosophy."⁶⁷ That he enjoyed quasi-divine status, that sundry miracles were ascribed to him; that his order observed tabus which savor of primitive magic—all this is vouched for by Aristotle.⁶⁸ The only writings ascribed to him by an early (fifth century) authority are the verses he is said to have published under the name of Orpheus.⁶⁹ Apart from the doctrine of transmigration and the belief that "things are numbers," the only idea we can credit to him with any measure of probability is the conception of the world in terms of a duality of principles, the finite and the infinite, the first being the principle of the good, the second of evil.⁷⁰ Here is something abso-

no good reason to doubt the testimonies of the biographical sources on this point, and (ii) even if the distinction did arise in the fifth century after his death, it could still account for conflicting dietary prescriptions in our fourth century sources. There are other factors, too—especially in the case of Aristoxenus (the most vehement opponent of the tradition of total abstinence), whose testimony is self-contradictory (cf. frag. 27 Wehrli, where he does concede that the Pythagorean diet was vegetarian after all but tries to explain it away by giving medical reasons for it) as well as in contradiction to some of the best authenticated original prohibitions (as, e.g., that of beans, which Aristoxenus denies, frag. 25 Wehrli), and can only be explained by his obvious effort to produce a rationalized, prettified portrait of Pythagoras, purged of magical features.

⁶³ A prominent feature of all the biographical traditions

⁶⁴ Herodotus's reference to him as "not the weakest wise man (*sophistēs*) among the Hellenes" (4.95) is, of course, no exception. Burnet wrongly translates *sophistēs* here as "scientific man" (*Greek Philosophy*, p. 85). The context (Pythagoras as a teacher of Salmoxis) makes it clear that Herodotus uses *sophistēs* here to mean "religious sage" as, e.g., at 2.49; Rathmann (p. 47) compares also Eur. *Rhesus* 949, which refers to Orpheus and Musaeus as *sophistai*; so also Protagoras in Plato *Prot.* 316d. But I do not mean of course to minimize Pythagoras' encyclopaedic interests in philosophy, mathematics, music, etc., which are amply attested by the general tradition and get near-contemporary witness in Heraclitus B40 and B109: the latter is now generally accepted as genuine (i.s. Diels) and is a good testimony to his wide learning, in spite of the fact that the words "practised inquiry (*historiēn*) above all men" is a sneer (so Verdenius, "Notes on the Pre-Socratics," *Mnemosyne*, S. III, Vol. 13 [1947], at pp. 283–84).

⁶⁵ 2.79, shorter version of the Florentine manuscripts, and Linforth's commentary (*The Arts of Orpheus*, 38ff.).

⁶⁶ *Rep.* 600b. Our best commentary on the sense that Plato's words here would convey to his audience are the numerous references to the way of life of Pythagorean sectaries in middle comedy (collected in DK, *Pythagoreische Schule*, E) where the dietary tabus are most prominent.

⁶⁷ *Busiris* 28–29.

⁶⁸ Fragments 191ff. Rose.

⁶⁹ Ion of Chios B2, cf. Iambli. *Vita Pyth.*, 146. For the interpretation see Linforth, *The Arts of Orpheus*, pp. 110ff.

⁷⁰ Aristotle, *f. N.* 1106b28, "for evil is a [form] of the unlimited, and good of the limited, as the Pythagoreans imagined"; also *Met.* 986a16ff., 987a13ff., 1093b11ff. What is "peculiar" to the Pythag-

lutely without parallel in antecedent or contemporary natural inquiry;⁷¹ and the contrast [111] is all the more striking in that the only Ionian philosophers Pythagoras could have known made the Infinite itself (Anaximander) or the Air (Anaximenes) the ultimate cosmogonic principle and endowed it with the attributes of divinity. Pythagoreanism not only rejects the monistic concept of nature axiomatic in the *physiologoi* but implicitly condemns their highest principle as evil. We can only infer that, whatever its details, this cosmological innovation was the speculative ground for the dualistic conception of man implied by the belief in transmigration, which is the one doctrine we can certainly ascribe to Pythagoras.

IV

No one who has ever plunged into the bottomless pit of research into Pythagoreanism will find it in his heart to blame Jaeger over-much for leaving out this whole chapter from his book.⁷² The omission is disconcerting, all the same. For if it is a philosophical *theology* that we are looking for in the pre-Socratics, it is only here that we shall properly find it.⁷³ For here we do get a

orinus says Aristotle (987a13ff. and cf. W. D. Ross, *ad loc.*), is that the infinite and the One (= the finite) are the "substance" of things and "this is why they said that number is the substance of all things"—a remarkable presentation of the doctrine that things are numbers as an inference from the ultimate cosmological dualism of finite-infinite. On this general topic, see W. A. Heidel, "Peirax and Apeiron in the Pythagorean Philosophy," *AGP* 14 (1901), [F. M. Cornford, "Mysticism and Science in the Pythagorean Tradition," *CQ* 16 (1922) and 17 (1923), and the latest study J. E. Raven, *Pythagoreans and Eleatics* (Cambridge, 1948), Chapter I, which finds exactly, I think, against Cornford that on Aristotle's evidence "there was in earliest Pythagoreanism no internal dualism," p. 18.] (and for the reliability of the ascription of the *Peirax-Apeiron* contrast to the earliest phase of Pythagoreanism, cf. my remarks in my review of J. Raven, *Pythagoreans and Eleatics in Gnomon*, 25 (1953), 30–31, {** 1.181–82}).

The difference would hold even as over against Alcmaeon, whose "opposites" are cited by Aristotle (*Met.* 986a27ff.) as a doctrine "similar" to that of the Pythagoreans: (i) the finite-infinite finities do not appear in Alcmaeon's list, nor do the implied arithmetical (odd-even) and geometrical (square-oblong) dualities, (ii) Alcmaeon's opposites are not discriminated as "good" and "evil" respectively (in spite of Aristotle's citation of "good and evil" at *Met.* 986a34), since Alcmaeon's norm of health is equipose (*isonomia*, B4) not subordination, as would be required for the term in each pair of opposites were held "good" and the other "evil." Alcmaeon was doubtless acquainted with the Pythagoreans at Croton, and many have been on intimate terms with them, but there is no evidence for regarding him as a Pythagorean: see W. A. Heidel, "The Pythagoreans and Greek Mathematics," *AJP* 61 (1940) at pp. 3–6.

There are scattered references to Pythagoreanism in the book (especially at pp. 83ff. and 54ff.) but these are only incidental to the discussion of other doctrines. A brief sketch of his view of the teachings of Pythagoras had been offered earlier in *Paideia*, Vol. I (pp. 161ff. of the second English edition).

Not in Empedocles' *Purifications*, for (as I shall argue in Section V) this work is not a genuinely philosophical theology, but a theology (in the more traditional sense) tacked on to the philosophical system of the work *On Nature*.

Reserving "agelessness" to the *Apeiron*,⁸⁰ he was taking away from the gods their most characteristic prerogative but doing so by the compulsion of his logic. In his system whatever has a beginning must have an ending. If the gods have a birth, they cannot be deathless; only the beginningless *Apeiron* can be truly ageless and immortal.

No less different from the popular gods is the *Apeiron* in its role of world "governor." Traditionally the justice of Zeus is "ordained unto men" and, quite explicitly in Hesiod, no further.⁸¹ Only occasionally are the "beasts" too drawn into the circle of his Justice.⁸² The forces of nature uncertainly personified as earthborn deities are subdued by Zeus in the battle with the Titans and brought more or less under his power. But there is no notion of natural laws issued and maintained by Zeus. So far from maintaining natural regularities, Zeus himself and the other gods override them right and left. To do so is their prerogative and indeed provides the main medium of omens, oracles, marvels, punitive thunderbolts, storms plagues, etc., through which they make known their will to men and enforce it upon them. What could be further from the Justice of the *Apeiron* whose [114] laws, fixed in the physical structure of the world, are cosmic in their scope and natural in their execution? When Jaeger tells us that Anaximander's cosmology offers "the first philosophical theodicy" (p. 36), it is essential to remember that the "justice" and "reparation" of fragment 1 operate simply through the self-regulative periodicities of a mechanical equilibrium.⁸³ This is certainly more, as Jaeger observes, than a "mere explanation of nature" in our sense of these words, or the words *justice* and *reparation* would be meaningless. But it is both more and less than a "theodicy" in any sense in which the Justice of the gods had been conceived or, for that matter, ever was conceived, by the clientele of the Greek cult. No theodicy could satisfy the cult which did not include a doctrine of individual providence, and no such doctrine could be squeezed out of Anaximander, or even Xenophanes, Heraclitus, and others who did call nature "god."⁸⁴ Philos-

is continued in the sixth-century theogonies is confirmed by the Aristophanean imitation in the *Birds*, verse 688 speaks of the gods as "the immortal, the ever being," while at verse 691 the theme of the theogony is announced as "the nature of the birds [= "gods" here], the generation of the gods . . ." Pherecydes' is the first known deviation from the tradition.

⁸⁰ B2, B3.

⁸¹ Hesiod *Op.* 276–78. [Solmsen, *Hesiod and Aeschylus*, p. 104n.6 observes: "Hesiod had restricted these 'ideas' [such as *dike*] to the dispensation of Zeus and to human society, setting them far apart from the physical entities like Earth, Heaven, Land, and Sea, which took shape early and have no part in the moral world order. In this important respect the Presocratics may be said to have destroyed the Hesiodic pattern." Cf. the citation from Solmsen in n.30 above. See also his remarks at p. 65 and pp. 159–60.

⁸² Archilochus, frag. 84. Hiller-Cr.

⁸³ I offer justification of this view at pp. 168ff. (**1.74ff.) of the paper cited above, n.17. I wonder whether Jaeger is true to his own methodological principle (cited above, p. 7) in speaking of "divine justice" in Anaximander without explicit consideration of the (purely physical) mechanism through which "justice" and "reparation" are maintained?

⁸⁴ Jaeger takes it for granted that the Justice and Reparation of Anaximander B1 occur not only

ophy could fill the order only by grafting Zeus's all-seeing eye on a cosmic power, watchful of every single life to requite its vice and virtue in minute proportion in this life and the next. It was probably the Pythagoreans⁸⁵ and after them certainly Plato⁸⁶ and the Stoics who performed this remarkable operation, and thus produced a properly theological theodicy. [115]

I hope my argument⁸⁷ has made it clear that it concerns more than linguistic propriety and would not be met had Jaeger dropped the word *theology* and spoken less provocatively of "the religious ideas" of the pre-Socratics. The real issue here is not verbal usage but historical matter of fact, i.e., the actual relation of the beliefs of the pre-Socratics to those of contemporary religion. I do not mean to suggest that Jaeger is unaware of the gulf between the two. He often alludes to it in one way or another and remarks in one place that the gap which exists in this period 'is never again entirely closed' (p. 174). My point is simply that, taking the gap for granted, he never stops to measure it. The

in the physical cosmos but also in the world of politics and morals (*Theology*, p. 35 and earlier in *Poetika*, I, 2nd. English ed., p. 160). There is no evidence for this assumption, nor is it possible to understand how it would fit Anaximander's physics. How would the balanced equalities of hot-cold, dry-moist, etc., enforce reparation of human wrongdoing? Heraclitus goes far beyond Anaximander in annexing "human" to "divine" law and justice. But even here the self-regulative execution of the "common law" inherent in the soul and the state falls far short of a doctrine of individual providence. So does Anaxagoras's *Nous* as, I think, is clear from the disappointment of the youthful Socrates with his cosmology in the *Phaedo*. Jaeger takes Anaxagoras B12 to mean that the ordering of creation by *Nous* proceeds in accordance with "preconceived world-plan" (p. 163) but I do not know how he gets this out of *ekosmōse* ("ordered/arranged") or *panta egnonous* ("Nous knew all things"). Anyhow, I think Jaeger would agree that, so far as we can judge from the fragments, Anaxagoras's *Nous* was not meant to fulfill the function of a personal providence. Neither would the Cosmic Intelligence of Diogenes' Air. Jaeger follows closely W. Theiler, *Zur Geschichte der teleologischen Naturbetrachtung bis auf Aristoteles*, Zurich, (1924) in assuming that Diogenes was the source for the providential arrangements of nature recited by Xenophon (especially at *Mem.* 1.4 and 4.3) but adds that we cannot read into this source the meaning they now have in Xenophon himself, "namely, that these are all ways in which the gods provide for man's needs" (p. 168). Theiler's learned and ingenious thesis has never received to my knowledge the criticism it deserves. Earlier S. O. Dickerman (*De argumentis quibusdam apud xenophontem* etc. Halle, 1909) had rejected the hypothesis that Diogenes was Xenophon's source (p. 48), to Dickerman's argument I would add that if Diogenes were as much of a teleologist as Theiler takes him to be, he could hardly have been so completely ignored in Socrates's vain search for a teleological cosmology in the *Phaedo*.

Not explicit in any reliable tradition of early Pythagorean teaching, but implicit in the whole doctrine of transmigration with its teaching of divine judgment and retribution. Cf. Philolaus' doctrine (B15) that the gods keep a "guard" over men.

⁸⁵ Notably at *Laws* 903b ff. Cf. F. Solmsen, *Plato's Theology* (Ithaca, 1942), Chapter 9.

⁸⁶ I have made no mention of the Eleatics who occupy a unique position among the pre-Socratics, partly because I have already sketched my interpretation of Parmenides' peculiar blend of mysticism and logic in 'Parmenides: Theory of Knowledge,' *TAPA* 77 [1946], at pp. 74–77.

⁸⁷ 161–63; partly too because I find Jaeger's account of Parmenides the most satisfying chapter in the whole book. "What Parmenides has done," he writes, "is to take over the religious form of expression and transpose it to the sphere of philosophy, so that in truth a whole new intellectual world takes shape" (p. 97). One statement I believe, of the treatment of religious ideas not only by Parmenides, but by all the *physiologoi* from Anaximander to Democritus

result of this omission is actually, though doubtless unintentionally, an underestimation of the vast distance between the two *types* of religious belief, and consequently a failure to exhibit the full dimensions of the unique achievement of the pre-Socratics as *religious* thinkers. This, in a word, lies in the fact that they, and they alone, not only among the Greeks, but among all the people of the Mediterranean world, Semitic or Indo-European, dared transpose the name and function of divinity into a realm conceived as a rigorously natural order and, therefore, completely purged of miracle and magic. To *moralize* divinity was not their main, and certainly not their unique, contribution.⁸⁸ Pindar and Aeschylus here labor in the same cause as Xenophanes and Heraclitus: and the Hebrew prophets were doing the same a good two centuries before Xenophanes, and with a passionate intensity unequaled by any Greek philosopher or poet. But the world of Pindar and Aeschylus is thick with magic of almost every description. The prophets of Israel and Judah fought a valiant rear-guard action against wizards, necromancers, and soothsayers. But they lacked the conceptual equipment to see that magic was not only a religious impropriety but a sheer impossibility; and they never cleared their minds of the notion of miracle which is the intellectual foundation of magic. Miracle remained a permanent feature of Hebraic as of Greek⁸⁹ and, later, Christian piety. To present the deity as wholly [116] immanent in the order of nature and therefore absolutely law-abiding was the peculiar and distinctive religious contribution of the pre-Socratics, and it should be put in the forefront of any account of their religious thought. They took a word which in common speech was the hallmark of the irrational, unnatural, and unaccountable⁹⁰ and made it the name of a power which manifests itself in the

⁸⁸ The same may be said of their contribution to religious universalism. Jaeger holds (*Theology*, p. 48) that this began in the Western world "neither with the Christian nor with the prophets of Israel, but with the Greek Philosophers." But the idea of one God who governs nature and all men is already in Amos (1.3-2.3; 5.8, 9.6-7).

⁸⁹ Plato's position here is most instructive. Transmigration itself is a miracle, since the immortal part of the soul is reserved to the reason and is disjoined from the passionate and appetitive parts which are explicitly said to be *mortal* (*Tim.* 69c ff.); how then could the identity of the *immortal* soul be preserved throughout its incarnations in animals, reptiles, etc., which are conspicuously lacking in reason? It is no use trying to explain away transmigration as a myth, since it is (i) the premise for the epistemological doctrine of Recollection in the *Meno*; (ii) the premise for the metaphysical doctrine of the immortality of the soul in the *Phaedo*, (iii) repeatedly recognized in the cosmology of the *Timaeus*. Plato's attitude to the irrationalities of the public cult which his state religion would conserve (*Rep.* 427bc, *Laws* 738cd) is a more complicated question. It may be, as E. R. Dodds argues ("Plato and the Irrational," *JHS* 65 [1945], pp. 22-23) that there is "little reason, and certainly so necessity, to credit Plato with a serious belief in the personal apud gods of Greek mythology and Greek cult." Yet Plato speaks as though he did accept the reality of good and evil daemons with power to intervene unaccountably in human life (*Laws*, 877a, {732c} [*Ep.* 7.336b]), and at *Tim.* 71 divination appears as a vehicle of "some apprehension of reality and truth" which, though quite inferior to reason, may still be due to "divine possession."

⁹⁰ So, e.g., in Herodotus in spite of his very considerable rationalism. Note his use of "the

operation, not the disturbance, of intelligible law. The transposition opened new religious possibilities. Had these been realized, Greek religion would have been freed of those evils which Lucretius in retrospect so justly imputes to it.

V

Had Jaeger done justice to this phase of the religious teachings of the pre-Socratics, he would have altered the perspective of much of what he has to say. And the main beneficiary would have been the chapter on "The Origin of the Doctrine of the Soul's Divinity," which makes Anaximenes, of all people, the bridge between earlier Greek beliefs about the soul and the Orphic doctrine. The argument is roughly as follows: We know that the Orphics thought of the soul as (a) divine and (b) independent of the body. Jaeger holds that they also thought it (c) incorporeal (p. 84) which, he thinks, would follow from (b), and (d) air-like, on the strength of Aristotle's reference to "the account in the so-called Orphic poems, [which] says that the soul comes in from the whole when breathing takes place, being borne in upon the winds."⁹¹ He thinks that (d) "already presupposes the philosophical theory [of Anaximenes] that air is the principle of life" (p. 80); and he also finds a connection with Anaximenes at (c), assuming that his breath-soul was "as incorporeal as possible" (p. 84), and also at (a), since Anaximenes taught that Air was divine.⁹² That raises more questions than it answers: Briefly, [117]

divine" to denote events such as these: the Cnidian workmen suffer an unaccountably large proportion of injuries (1.174 4), the cats in Egypt rush headlong into the fire (2.66); Ariston is convinced that not he, but an apparition, has had intercourse with his wife (6.69); the wrath of Talithybus descends on the perfectly innocent sons of Spertheias and Bulis (7.134). When the event is so strange that it is no use even looking for a natural explanation, then it *must* be "divine." *Per contra*, if a thing can be explained by natural means, it cannot be divine (7.16 2). So the author of *On the Sacred Disease* (1): "men think it [the 'sacred disease'] divine (= *theon pragma*, same expression as in *Hdt.* 2.66 and 6.69) because of their inexperience, and its marvellous character, and the fact that it does not resemble anything else."

⁹¹ *De An.* 410b22ff. (= Orpheus B11), in the Oxford translation.

⁹² In attributing the doctrine of the divinity of the cosmogonic power to Anaximenes, Jaeger seems to argue (*Theology*, p. 36) mainly from the fact that it was already taught by Anaximander and would thus be conserved by Anaximenes. If, as I have argued, there is no definite evidence for ascribing the divinity of the *archē* to Anaximander, independent grounds for crediting it to Anaximenes must be offered. These I can only find in later testimonies (Cicero, Aëtius in A10), which, however, may be suspected of confusing the doctrine of Anaximenes with that of Diogenes of Apollonia, who *did* teach the divinity of the cosmogonic Air. It may be worth noting that our most comprehensive and reliable account of his system, that of Hippolytus (*fidissimum excerptorem*, Diels found him, *Dox. Graeci*, p. 132) makes no mention of the divinity of Air but only says that "gods and things divine" were "generated" from Air (A7); and that St. Augustine (*Civ. Dei* 8.2) seems to agree with Hippolytus, saying that "the gods arose from the air."

(i) Chronology: Where is the evidence that the Orphic theory of the soul comes after Anaximenes? But

(ii) why need Jaeger make such an assumption? He argues convincingly⁹³ that the breath-soul is an old, pre-Homeric notion, as evidenced in such expressions as "breathing out one's soul." Why need the Orphics get from Anaximenes an idea long embedded in their mother tongue?

(iii) If the Orphics thought of the soul as air,⁹⁴ would they think of it as incorporeal? Is air incorporeal?

(iv) Anaximenes certainly did not think the soul "as incorporeal as possible," but the reverse. To say that everything, from fire to earth, is air, is to say that soul, as air, is as corporeal as anything else.⁹⁵

But none of this really gets to the heart of the question. The stark, irreconcilable contrast between Ionian naturalism and Orphic dualism would be untouched by any theory of the material composition of the soul the Orphics may have entertained, even if this were borrowed from philosophy. Anaximenes himself may have taught the divinity of the soul, though there is no such statement in either fragments or testimonies. This way of speaking and thinking is quite congenial to the temper of Ionian philosophy. [118] We find it in

⁹³ In agreement with the view of E. Bickel, *Homerische Seelenglaube* (Schriften der Koemgsberger Gelehrten Gesellschaft I [1925], Heft 1).

⁹⁴ I see no good reason to doubt Jaeger's view that they did, though no such conclusion is warranted by one of the sources to which he looks for support (*Theology*, pp. 80 and 84), sc. Aristotle's report (*de An.* 213b22ff.) of the Pythagorean view that the *ouranos* "breathed" in "air" and "void" from the surrounding infinity: Aristotle's report does not say that this inhalation is soul, nor could it, since, *qua* infinite, the void would come for the Pythagoreans under the heading of the "evil" principle, which would certainly not be that of the (divine) soul. Aristotle's single reference to the Orphic theogony (above, n. 91) seems slim ground on which to base the reconstruction of their theory of the soul, but perhaps good enough where positive evidence is so hard to come by. Here, however, we should note that Aristotle's report does not strictly say that in this view soul was air; fire, or the fiery aether, could also be "borne about" by winds and "inhaled" (so in the philosophers, e.g., Heracl. A16, Democ. A106). Jaeger doubtless means to use "air" broadly enough to include fiery aether (clearly so in another context, p. 208n.63, where he refers to Heraclitus' theory of soul as "air"), and with good reason since the distinction between air and aether is hazy enough in philosophers (for Heracl. cf. B31, B36, B76, for Emped. note that "air" in B17 18 = aether in B71 etc., while at B38 aether = fire) and would be even hazier in popular thought. In Anaximenes soul is warm air (B1 *sun fin*). When the mystery cults contrast the *aetheral* soul with the earthborn body (see above, n. 60) it is safe to assume that the contrast is between the warm, bright aether of the soul and the cold, dark earth of the body no less than between the volatile consistency of the "breath" soul and the heavy, compact earth-body.

⁹⁵ Cf. Diogenes of Apollonia B7 "[air is] an eternal immortal body." Jaeger says that Anaximenes "did not identify it [sc. soul = air] with any corporeal substance of the world of experience" (p. 84). I believe that this is precisely what he did (see B1 which offers a primitive sort of experimental evidence for the "warm air" theory of soul), his choice of Air in place of Anaximander's *Apemn* being dictated by the desire to find a cosmogonic substance in "the world of experience," taking pains to explain the particular physical circumstance under which the air about us is "imperceptible" (A7).

Heraclitus,⁹⁶ Diogenes of Apollonia,⁹⁷ and even Democritus!⁹⁸ There is no reason why Anaximenes too would not have welcomed the idea on the same terms. But what would it have meant to him on *these* terms? In Ionian philosophy the divine is nature itself, its basic stuff and ruling principle. To say that the soul is divine is then to naturalize it; it is to say that it is subject to the same sequence of law and effect which are manifest throughout the whole of nature. And this is the very opposite of the Orphic doctrine of the divinity of the soul, whose content is rather obscure, but whose intent is perfectly clear: that the soul is not a natural, but a supernatural, entity. The word *supernatural* would not, of course, figure in their vocabulary. But it would describe their meaning better than any word at our disposal. When they said that the soul was divine, they meant that it is an exile from another world: its stuff is god-stuff; its powers are not bound by the limits of the observable uniformities of nature but include the oracular and other magical powers of divine being;⁹⁹ its destiny is determined not by the natural properties of air, fire, etc., but by the mysterious will of superior gods who impose on this lesser *daimon* the penance of transmigration, and prescribe, through their priests and prophets, the necessary purificatory rites and tabus. Could one imagine a sharper antithesis to any doctrine of the divinity of the soul that Anaximenes could possibly have taught?

The only answer I can think of would be by way of Empedocles. Here we do have a philosopher, and of the first order, who is also a devotee of Orphic purity. If it could be shown that what his natural philosophy tells us about the soul will square with his doctrine of transmigration, we would have strong, indeed conclusive, grounds for saying that the two doctrines are not as incompatible as we must think them on the strength of all our other evidence. And this is precisely what no one has yet succeeded in showing. Jaeger does not attempt and, if I read him aright, does not intend so much. He recognized the

"If we may read so much into the equation of *thnētoi* *athanatoi* at B62 (cf. B77)

In the valuable testimony of Theophrastus (*De sensu* 42) to which Jaeger draws attention, *Theology*, p. 171.

⁹⁶ See "Ethics and Physics in Democritus," (cited above, n. 74), pp. 580-82 (** I 330-32).

⁹⁷ For the oracular power of the soul which "has come from the gods," see Pindar's famous frag. 131 Schroeder. For the sundry magical powers (including oracles) claimed by the Orphic adept, our best texts are Empedocles B111, B112, B129, with Empedocles' claims (in his capacity of Orphic god-man) to control the winds and make rain, cf. those of the magicians and purifiers in *On the Sacred Disease* (4): "they profess to know how to bring down the moon, eclipse the sun, make storm and sunshine, rain and drought, the sea impassable and the earth barren." For other instances of Orphic magic, see Eur. *Cycl.* 647-49, and Plato *Rep.* 364bc, which includes black magic (*katadesmoi* here = *katadesels* in *Laws* 933a, the *tabellae defixionis*, on which see M. P. Nilsson, *Greek Popular Religion*, New York, 1940, pp. 114-15). Such things were practiced no doubt only by the lowest type of Orphic priests who, however, cannot be dismissed as merely "quack" Orphics (see above, note 45); the fact that priests who invoke the authority of books by Orpheus and Musaeus for their rites practice this kind of magic is a significant commentary on the Orphic concept of the soul.

"basic incompatibility"¹⁰⁰ between the "mystico-theological" [119] thought-forms of the *Purifications* and the rationalistic logic of the poem *On Nature*. But he still argues for some sort of imaginative coherence between the two: "In the mythical space of a world pervaded by divine figures, the two attitudes so irreconcilable from our abstract point of view will be seen to fit together as two distinct, but in the last analysis basically homogeneous, spheres for the interplay of divine forces."¹⁰¹ I can only say that, after reading this chapter with care and accepting gratefully much of its detail, I do not find that the promised reconciliation comes off. Not only from our "abstract" point of view, but from Empedocles' own as well, the two pictures of reality remain not only heterogeneous but contradictory at crucial points; they admit of no rational or, for that matter, even imaginative harmony.

Take, for instance, the major fragment of the *Purifications* where the fatality of transmigration is somehow blamed on Strife.¹⁰² "In this way," Jaeger remarks, "the philosopher tries to interpret the fundamental religious facts of the Orphic theory in accordance with the supreme principle of his natural philosophy" (p. 150). But the natural philosophy does not single out Strife as *the* power which sets in motion the wheel of becoming. Love is at least as necessary.¹⁰³ What is more, *On Nature* speaks of Love as the creator of "mor-

¹⁰⁰ P. 133. For sample of the opposite view at its boldest extreme, see Cornford *From Religion to Philosophy*, p. 241: "Empedocles . . . exemplifies, in a most remarkable way the . . . view that men's cosmological views were most entirely dictated by, and deduced from, their religious convictions." A similar view is expressed in more temperate language in Cornford's chapter on "Mystery Religions and Pre-Socratic Philosophy," in Vol. IV of the *Cambridge Ancient History*, pp. 566–69 (and more recently in C. H. Kahn's "Religion and Natural Philosophy in Empedocles' Doctrine of the Soul," *AGP* 42 (1960), 1–35).

¹⁰¹ P. 134. I cannot be sure that I understand exactly what Jaeger means here, but suspect that he reads more into the deification of the four roots in *On Nature* than the evidence allows. All Empedocles means by calling them "gods" is to call attention to their (a) privileged immortality against the mortality of all other physical substances (as I have argued in "The Physical Theory of Anaxagoras," *PR* 59 [1950], pp. 36–37 (** 1 309)) and (b) joint and equal share along with Love and Strife in the maintenance of the cosmic order (see the paper cited above at n. 17, pp. 159–60 (** 1.62–63)). This sort of divinity builds no bridges to the *Purifications*.

¹⁰² B115 13–14, " . . . an exile from the gods and a wanderer, for that I put my trust in insensate Strife" (translation after Burnet), which Jaeger takes for "a mythical way of expressing its (sc. the wandering soul's) entanglement in the cosmic machinery under the rule of Hate" (*Theology*, p. 150). He had offered a different interpretation in *Paideia* (Vol. I, 2nd ed. of Eng. tr., p. 169, with reference to B115.9ff.): "In the cosmos revealed by the physicists, the soul (sc. of Orphic piety) can find no home." But if this is (as I believe) the right interpretation, I do not see how Empedocles may be said to present "a synthesis which shows very instructively how these two different ways of viewing the world (sc. Orphism and *physiologia*) could supplement and complete each other" (*loc. cit.*)

¹⁰³ As Jaeger justly observes (p. 140), "Hate is as necessary as Love to maintain its (sc. the world's) dynamic structure, even though Empedocles loves Love and hates Hate." Hence Hate's "equality" (B17.77) with Love—a powerful testimony to the subordination of religious feeling to the requirements of the physical system in this poem

al forms," while on Jaeger's interpretation, this fragment of the *Purifications* assigns just this function to Strife.¹⁰⁴ Again, if the Golden Age of the *Purifications*, as Jaeger interprets it (pp. 150ff.), stands for a world where Love holds undisputed sway, the imaginative construct would clash badly with that of the physical poem. For without Strife, the cosmologist holds, there could be no world at all, good or bad, only an indiscriminate mixture, no individual gods or daemons [120] or anything else.¹⁰⁵ But the *Purifications* speaks of men, beasts, and birds, as well as gods, when "the flames of good fellowship glowed" in the Golden Age (B128). Just how then are the *Purifications* "in the last analysis basically homogeneous" here with the cosmology?¹⁰⁶

As for the concept of the soul, Empedocles' natural inquiry presents us with a cardinal doctrine, explicit in the surviving fragments and enormously influential on Greek medical thought. It is the well-known theory that perception and thought are the functions of the blood, which is conceived as a mixture of the four elements in equal ratio.¹⁰⁷ But blood can hardly exist without "flesh"; and in the *Purifications* flesh is termed in Orphic fashion an "alien garment"¹⁰⁸ which the wandering daemon puts on when, and presumably only when, he serves his sentence in the wheel of transmigration. How then does he get along without it in his first and last estate of discarnate blessedness? How does he think the thoughts of love when he has nothing to think with?¹⁰⁹

¹⁰⁴ Cf. φουμένους παντοία διὰ χρόνου εἶδεν θνητῶν, B115.7 with θνητ' ἐφύοντο and χεῖρ' ἔθνεα μυρία θνητῶν, παντοίαις ἰδέσθαι ἀρεστόα of B35.14–17, under the influence of ἀποτυπὸς οὐρα

¹⁰⁵ Not only men, animals, and plants, but also the "long-lived gods" come into being only when the world-process is set in motion *ek touron*, sc. Love and Strife (B20.9ff.).

¹⁰⁶ Two more of the many points which cannot be dealt with here: (1) "It has already been correctly observed that the theory of the four elements, as it is generally called, is presupposed in the *Katharmoi* as well" (p. 143). This on the strength of B115.9ff., which, however, on Jaeger's earlier interpretation (above, n. 102), voices the hostility of the natural universe to the Orphic soul. Is there any suggestion, here or elsewhere, that the four elements would (along with Love and Strife) pervade the whole of reality in the *Purifications*, as they certainly do in *On Nature*? (2) It is not quite clear whether Jaeger means to identify (as he seems to do, *Theology* pp. 140ff.) the *Sphairos* of *On Nature* with the "holy and unutterable mind" of B134. See K. Reinhardt's arguments against the identification by W. Kranz, *Empedocles* (Zurich, 1949), p. 48, in his review of this book in *CP* 45 (1950), pp. 176–77.

¹⁰⁷ B98. B105

¹⁰⁸ B126. To Jaeger's comment, "in this image we see corporeality regarded as a mere transient, non-essential wrapping—a conception just as strange to the Greek of Homer's time as it is to the Ionian philosopher" (p. 147), I would merely add: and just as strange to Empedocles himself *qua* philosopher and medical man.

¹⁰⁹ I cannot imagine how this and many other difficulties could be met by Cornford's view (*From Religion to Philosophy*, p. 239; now revived by H. S. Long, "The Unity of Empedocles' Thought," *AJP* 70 [1949] at pp. 156–57) that the transmigrating soul is a compound of Love and Strife. In any case, such a view remains purely conjectural, there is no support for it in fragments and/or testimonia, which always treat mental processes as functions of the ratio not of Love to Strife but of earth to water to air to fire

It is better to drop the question and therewith the assumption that Empedoclean physics and mysticism are "basically homogeneous." Jaeger spoke of Empedocles in *Paideia*¹¹⁰ as a "philosophical centaur, . . . a prodigious union of Ionian elemental physics and Orphic theology." "Prodigious" is the right word for the union of physics and theology, as it is for the junction of immortal god and mortal flesh. The one is as much of a miracle as the other, and Empedocles doubtless devoutly believed it to be such. He left us no explanation of either, and it would be futile to try to supply it by rationalizing the theology of the mystic or mystifying the logic of the cosmologist.^{110a}

To set the contribution of pre-Socratic philosophy to the concept of the soul in its just historical perspective, we must see how here, as in its concept of God, it is its peculiar genius to transpose a religious idea into [121] the medium of natural inquiry, transforming, but not destroying, its associated religious values. It is the function of high religion to foster man's reverence for himself no less than his reverence for God. In this respect the record of Greek religion can hardly be called a success. The fault lay at least in part with its traditional concept of the soul as the "image" or "shadow" of the real man, which was somehow the principle of life but neither of feeling nor judgment.¹¹¹ This psyche's ghostly survival after death was a wretched affair; Homer regards with mixed feelings of gloom and contempt the flitting, squeaking, bathke¹¹² creatures in the "joyless" regions¹¹³ of nether darkness.¹¹⁴

This flimsy support for the sense of reverence for life could be strengthened in one of two opposite ways. The supernatural psyche could be retained and reformed, turned into an infinitely more robust affair, human and superhuman, an incarnate god or daemon, possessing in life and conserving after death all the powers of thought, will, and passion of the full-blooded man, with an extra load of divine powers thrown in for good measure.¹¹⁵ This was the way of the mystery cults. The Orphic theogones, Pythagoras, the Empedocles of the *Purifications*, and finally and most triumphantly Plato, adopted and justified this faith. Plato's influence made it a dominant doctrine

¹¹⁰ Vol. 1, 2nd English ed., p. 295. {110a. For a thorough treatment see now A. A. Long, "Thinking and Sense-Perception in Empedocles: Mysticism or Materialism" *CQ N S.* 16 (1966), 256-76 }

¹¹¹ I follow here Jaeger's view (pp. 74 and ff. with notes) that *psychē* in Homer refers not only to the ghostly residue which survives death but also to the principle of life in the living person. The latter had been ignored in Rohde's classic on this theme. Jaeger seems to make a judicious synthesis of the best features of Rohde's work with those of his critics.

¹¹² *Od.* 24.1ff.

¹¹³ *Od.* 11.94; an idea repeatedly echoed in tragedy, Aesch. *Eum.* 301, 423. Eur. *Or.* 1082-84.

¹¹⁴ M. P. Nilsson, "The Immortality of the Soul," *Eranos* 39 (1941), pp. 1-16, at p. 3: "The Greek Underworld was a gloomy and terrible place, and its terror consisted just in its emptiness, its nothingness. The afterlife is at most a vacuum, the soul a worthless, useless shadow. It is evaluated accordingly."

¹¹⁵ See above, n. 99.

of Hellenistic thought; thence it passed with appropriate modifications into Christian theology, as Jaeger observes (p. 73). Whatever our estimate of the wisdom of this conception, we have no right to call it *the* Greek view of the soul. No less Greek was the radical alternative chosen by the pre-Socratics. They too merged the psyche with the feeling *thumos* and the thinking *nous*. But they did so without regard to the cult and with no concessions to magic. They assumed from the start¹¹⁶ that they could apply to the soul the same categories of understanding [122] which formed the framework of their natural inquiry. They thought of it as a part of nature, with a natural origin and a natural ending, but as no less divine for being just that, since it shared the powers of wisdom and justice writ large throughout the universe and could therefore realize within the human microcosm some measure of the order which ruled the infinite worlds. This was its destiny, natural and divine, to be that unique thing, "a self-increasing logos."¹¹⁷ Except for Heraclitus, the pre-Socratics were too preoccupied with cosmological and physiological problems to develop the potentialities of this idea. But we can see its vitality in Democritus, where the sense of reverence for man survives the loss of faith in God.¹¹⁸ He can no longer believe in the divinity of nature, but he still believes in the divinity of the soul.¹¹⁹

Anaximander (A11, A30), in assuming that man arose from purely natural substances (earth and water) by a purely natural process (heating by the sun); Anaximenes (B1, B2), in assuming that the properties of soul are simply those of air. This initiates a tradition in which a dualistic conception of soul-body is unthinkable: soul *is* body, either a particular physical substance in the body (air in Anaximenes and Diogenes, fire in Heraclitus and the atomists) or else the mixture (*krasis*) of the physical components of the body as a whole (Parmenides) or of the blood (Empedocles). The detachable ghost-soul of Homer or God-soul of the mystery cults is precluded. Immortality is implied or asserted (Heraclitus, Alcmaeon) in quite another sense, i.e., the physical survival of the substance(s) which make it up but which does not imply the preservation of personal identity so essential for the mystery cults. Anaxagoras' doctrine of the "unmixed" *nous* is the first break in the tradition, though it is not made the basis of any doctrine of personal immortality.

¹¹⁶ Heraclitus B115.

¹¹⁷ See above, n. 98.

¹¹⁸ For a thorough criticism of an earlier draft, I am indebted to my colleague, Friedrich Solmsen. The opinions in this paper are my own, but many suggestions which have improved it have come from him.

SOLONIAN JUSTICE

1. THE JUSTICE OF THE *POLIS*

A. *The Naturalization of Justice*

SOLON'S FRAGMENT 4 is a document of the highest importance in the development of Greek political ideas.^{1,2} For here, as Jaeger has shown, justice is presented as a natural, self-regulative order.³ To be sure, "natural" does not mean "secular." The most self-consciously naturalistic chapters of Greek thought—pre-Socratic philosophy and Hippocratic medicine—continue to assume that natural events can be no less "divine" than supernatural ones.⁴ Certainly, Solon thinks of justice as a divine power.⁵ But he describes its operation in Fragment 4 strictly through the observable consequences of human acts within the social order. The vindication of justice comes "like an inescapable plague upon the whole *polis*; swiftly the *polis* falls into evil bondage; bondage stirs up strife and slumbering war; war destroys many in the beauty of their youth" (lines 17–20).

From CP 41 (1946): 65–83. Used by permission. Minor changes in spelling and punctuation have been made by the editor

¹ This is one of a series of studies in the philosophical foundations of Greek democracy. My grateful thanks are due to the Canadian Social Science Research Council for a grant-in-aid, and to the librarian of Harvard College and his staff for their many courtesies.

² All citations of Solon's verse refer to the latest edition by J. M. Edmonds in the Loeb Classical Library, *Elegy and Iambus*, Vol. I (1944). (Edmonds's numbering is largely as in Bergk.)

³ "Solon's *Eunomie*," *SPAW*, 1926, pp. 69–85, at pp. 78–80; *Poideia*, I, 139–40, of the English translation. My heavy debt to Jaeger will be evident throughout the first part of this paper. I also owe much to the following specialized studies, to which I refer hereafter solely by the author's name: Charles Gilliard, *Quelques réformes de Solon* (Lausanne, 1907); Ivan Linforth, *Solon the Athenian* (Berkeley, 1918); K. F. Freeman, *The Life and Work of Solon* (Cardiff, 1926); W. J. Woodhouse, *Solon the Liberator* (Oxford, 1938). On the other hand, I have had no occasion to make specific reference to a number of other works which I have found helpful, especially W. C. Greene, *Moirai* (Cambridge, Mass., 1944); and V. Ehrenberg's stimulating essays *Die Rechtsidee in frühen Griechenland* (Leipzig, 1921), and "When Did the Greek *Polis* Rise?" *JHS*, 57 (1937), 147ff.

⁴ For the earlier of the pre-Socratics, this must be obvious. For the most difficult cases of Anaxagoras and Democritus see, respectively, DK 59 A 48; and my "Ethics and Physics in Democritus," *PR* 54 (1945), 578ff., at 581–82 (** 1.330–32). For the Hippocratic literature the subject requires fresh treatment; meanwhile see W. Nestle, "Hippocratica," *Hermes* 73 (1938), 1ff.; and H. Diller, "Wanderarzt und Aetologie," *Philologus*, Supplementband 26 (1934), 55–56.

⁵ Clear enough in Frag. 4, 14–16, and obvious Frag. 13, where justice merges with the wisdom and power of Zeus

Jaeger contrasts this with the Homeric and Hesiodic sanctions of justice: famine and plague (Hesiod *Op.* 243); sterility of women (ibid. 225); barrenness of land (*Od.* xix. 111; Hesiod *Op.* 232 and 237) and of sea (*Od.* xix. 113). Hesiod adds war and military defeat (*Op.* 228–29 and 236–37) to his list of punitive measures. But the list as a whole clearly belongs to the order of magic.⁶ It recalls the powers of [65] the magician-kings who can procure good crops for their people no less than victory in war.⁷ It recalls, too, the similar chains of calamities superstitiously imputed to the lunar eclipse,⁸ to the unpurified pollution,⁹ or to the effect of a curse. The "imprecation and mighty curse" preserved in Aeschines iii. 111¹⁰ tallies with Hesiod almost point for point in its list of sanctions: "that their land bear no fruit;¹¹ that their wives bear no children like those who begat them, but monsters;¹² that their flocks yield not their natural increase;¹³ that defeat await them in camp and court and marketplace;¹⁴ that they utterly perish themselves, their houses, and their *genos*."¹⁵

Solon is as earnest a moralist as Hesiod. But instead of turning loose upon his audience the traditional repertoire of superstitious terrors, he makes them look at history, considering cause and effect. There is no evidence that he

⁶ I am not forgetting that Hesiod, too, can picture justice in natural terms (as in *Th.* 80–92). After all, it is not hard to see that a wise, "sweet-tongued" judge is a social asset, while a "bribe-eater" is a social menace. It takes much more to reach the conception of justice as a comprehensive self-regulative order. One must see, as did Solon, (1) that *everyone*, not merely the "god-like" dispenser of justice, is bound by this order and may respect or ignore it to the common benefit or ruin and (2) that the train of consequences that issue from just and unjust acts determines the destiny of all in the community so completely that any further appeal to magical sanctions becomes superfluous.

⁷ M. P. Nilsson (*Homer and Mycenae* [London, 1933], p. 220) cites an interesting parallel: the kings of the Swedes and the Burgundians were held responsible for the luck of their people whether in the matter of victory, weather, or good crops. It is related that the Swedes sacrificed their king if the crops failed, and the Burgundian kings were deposed if the luck of the war or the crops failed.

⁸ Pindar *Paeon* 9.1–20; the eclipse is a "sign" both of social disasters, like war and *stasis*, and natural catastrophes, like frost, storms, floods (Storms and floods as punishment for "crooked judgments" in *H.* xvi. 388–92).

⁹ Barrenness of land and womb for pollution in Sophocles *OT* 25–28 and 270–75; Hdt. vi. 139–1 and ii. 65. 7; Antiphon ii. 1. 10; Paus. viii. 53. 2–4.

¹⁰ J. A. O. Larsen ("Federation for Peace in Ancient Greece," *CP* 39 [1944], 145–62, at 147 and nn. 3, 4, and 6) has called attention to the same comparison and further to the striking similarity of the formula in this curse with that in the stele at Acharnae which purports to be the Plataean oath (see L. Robert, *Études épigraphiques et philologiques* [Paris, 1938], pp. 307–8, lines 39–46, with the emendation of line 42 suggested by Robert at p. 314). The imprecatory formula in many other Greek oaths is much the same (see examples cited by Robert, p. 313nn. 2 and 3).

(1) *Op.* 237: καρπὸν δὲ φέρει ζείδωρος ἄρουρα

(1) *ibid.* 235: τέχουσιν δὲ γυναῖκες εὐκότα τέκνα γονεῦσιν

(1) *ibid.* 232–34

¹⁴ Cf. *ibid.* 246–47

¹⁵ Cf. *ibid.* 244: μινυθούσι δὲ οἶκον

thinks of a concept of social causality; but he certainly thinks with one. Snow and hail come from clouds; thunder from lightning; the ruin of the city from big men; the bondage of the *dēmos* from ignorance.¹⁶ Fragment 12 gives the opening lines of what must have been a similar comparison between nature and politics: "The sea is stirred by (*ex*) the winds; if someone does not move it, it is the justest of all things."¹⁷ Semonides of Amorgus had pictured the sea as double-natured, capriciously shifting from one mood to its opposite: "often she stands quiet and harmless . . . ; often she is mad, borne along with thunder-striking waves."¹⁸ Solon objects: the change is not arbitrary; disturbance is not the natural ("just") state of the sea;¹⁹ if it gets into this condition, there must have been a disturbing cause.²⁰

To appreciate the naturalism of this way of thinking, one should recall that it bypasses entirely a set of ideas which had recently attained wide influence over Greece generally and over Athens in particular: the conception of justice in terms [66] of religious pollution. We know that Draco's code of homicide—published in Solon's boyhood—is steeped in this ideology.²¹ We know, too, that the Cylonean feud—which reached a critical stage before Solon's archonship—turned about the "pollution" of one of the contending parties.²² Finally, we may recall that Solon was intimately associated both with Delphi, the official center of the theory and practice of purification, and with Epimenides, a rival prophet of ceremonial purity.²³ This was more than a reli-

¹⁶ Frag. 9 in paraphrase. "From" is *ek* with a temporal-causal sense. In the last clause the relation is expressed through the dative, *aidriēi*.

¹⁷ For *dikaioiutē* in the manuscripts, Edmonds substitutes *akaiotatē*, without good reason, it seems to me.

¹⁸ Frag. 7.37–40 (Diehl). *Thalassa apēmōn* here (cf. Hesiod *Op.* 670: *pontos apēmōn*) is the simplest clue to *thalassa dikaioiutē* in Solon. But cf. also Hdt. vii. 16 (cited by Linforth, *ad loc.*): "winds, falling upon the sea, do not suffer it to be in accordance with its own nature" (*phusi tēi heōutēs chrēsthai*): when disturbed, the sea cannot "be itself."

¹⁹ The natural state is "just": cf. *On Fractures* I: *hē dikaioiutē phusis*, of the straight line in which the physician should make extensions in the treatment of dislocations and fractures; and again (*ibid.*): *ὑπὸ τῆς δικαίης φύσεως ἀναγκαζόμενος* with the same sense.

²⁰ That it is the winds that agitate the sea is, of course, no invention of Solon's (*H.* 4. 423; Hesiod *Op.* 675).

²¹ This is a safe inference from the interdict against the slayer, as well as from his exile and from the right of killing or arresting him should he return unlawfully. See Bonner and Smith, *The Administration of Justice from Homer to Aristotle*, I (Chicago, 1930), 113ff., for the English translation and interpretation of Draco's law (Hereafter I shall refer to this book, to which I am deeply indebted, as "Bonner and Smith.")

²² Hdt. 5. 71. Thuc. 1. 126; Plut. *Solon* 12. Plutarch adds that Solon actively intervened in the settlement which procured the exile of the "polluted" party.

²³ For the association with Delphi: Plut. *Solon* 11. 1 and 14. 4; also Aeschines 3. 108. For Epimenides: Plut. *Solon* 12.4–6. I say "rival" though the issue is immaterial to my argument—on the strength of Epimenides Frag. 11 (in DK, 3 B 11):

οὔτε γὰρ ἦν γαίης μέσος ὁμφαλῶς οὔτε θαλάσσης
εἰ δέ τις ἔσται, θεοῖς δηλός, θνητοῖσι δ' ἄφαντος.

gious matter; its sponsors recommended it as the means to the "justice" and "unity" of the state.²⁴ Conversely, the state must have seen in the doctrine of purification a powerful sanction of its centralized justice: the "stain," a source of public danger, creates a public interest which requires the compulsory intervention of central authority.²⁵

In Aeschylus, Sophocles, and Antiphon the orator, we see how strong a hold these ideas must have had at one time over the popular imagination. Plato accords them fulsome deference as the sanction of his own law of homicide.²⁶ Nor have we any ground for questioning Solon's own pious adherence to the rites and ideology of purification. He conserved intact Draco's law of homicide and maintained the Areopagus not only as a homicide court but also as a "guardian" of the state with broad and undefined powers to "straighten" wrongdoers.²⁷ This heritage from aristocracy, with its associated ideas of the Erinyes, blood-stain, and propitiation, he kept, but kept in its place.²⁸ He then turned to a different concept of political justice to furnish the rationale of the new democratic institutions.²⁹

The justice of pollution belongs to a realm of mystery, whose logic can be adumbrated in the form of myth but cannot be understood by ordinary human

This is clearly an attack on Delphic doctrine (so recognized by Wilamowitz, *Der Glaube der Hellenen* [Berlin, 1931], 2, 37n. 2). L. R. Farnell (*Cults of the Greek States* [Oxford, 1896–1909], 4, 297) notes that in Epimenides' lustration we find no "recognition of Apollo," in spite of the fact that the purification of the city had been ordered by Delphi (Diog. Laert. 1. 10–110). Altars which memorialized the purification at Athens were "nameless" (*bōmous anōnumous* [*ibid.*]). Why, then, does Farnell (*Cults*) assume that Epimenides was Delphi's choice for the lustration?

²⁴ Plut. *Solon* 12.1–6.

²⁵ The crucial process in the transition must have been the pronouncement of the interdict. Originally this was in fact, as it later continued in theory, the business of the victim's family (*IG* 12. 115, lines 21–22; Antiphon vi.34; Demosthenes xlvii. 69). But the effect of this pronouncement is public business, for it excludes another citizen from the city's public life on the ground that his presence there would be a public danger. The state steps in to reserve this right to itself (*Caput Arist.* *Ath. pol.* 57. 2, and other references cited *ad loc.* in Sandys's edition); therewith the state becomes the compulsory judge of the guilt of the accused and assessor of the punishment which will satisfy the public interest.

The belief in purification seems to have been weakening during the fourth century, its practice falling into disuse (see Bonner and Smith 2, 205–7). Plato's frequent references to "purification in accordance with Delphic rites" suggest a zealot's effort to reverse the trend.

²⁷ *Ath. pol.* 8. 4.

²⁸ Solon did not hesitate to invade this sacred area of Eupatrid exegesis under stress of compelling public interest, as, e.g., in his funeral regulations (see below, n. 67).

²⁹ I do not mean to suggest two watertight compartments. One could cite many magical ideas in Attic civil and constitutional law. The most obvious instance is the whole conception of the oath as a curse. Solon himself was willing to exploit the curse for so mundane a matter as the enforcement of his export regulations (Plut. *Solon* 24. 1). Such vestiges, important as they are, do not affect my thesis that Solon's judicial and constitutional reforms are inspired by a natural rather than a magical conception of justice.

[67] reason. Its claim to truth rests upon the authority of the oracles which support it or upon the antiquity of the tradition which certifies it.³⁰ Solonian justice, on the other hand, is intelligible in principle; its judgments are verified in the common experience of the *polis*. Though "obscure" (*aphanes*)³¹ and "most difficult to understand" (*chalepotaton noēsai* [Frag. 16]), it remains a "measure of judgment" (*gnōmosunēs metron* [ibid.]). The fact that this "measure" is all-comprehensive ("has the end of all things" [ibid.]) does not put it beyond the reach of human understanding: Theognis, echoing this very line of Solon's, thinks of "the judgment which has the end of all things" as a gift gods give to *mortals* (lines 1171–72).³² Certainly Solon expects it to be understood in sufficient measure to enlighten the "citymen" (Frag. 4.5) and the *dēmos* (Frag. 9. 4) as to the ends of their political action or inaction and thus save them from disaster. What "the Athenians"³³ cannot see for themselves, they can at least be "taught" (Frag. 4. 31). And they can test this teaching in the light of their own experience:³⁴ "time" will show whether the teaching is madness or the reverse, "when the truth itself becomes public."³⁵ In this "public" universe of discourse, Solon can now explain what it is that makes justice a matter of common concern to every member of the community. He does so in terms of two ideas: the common peace and the common freedom.

³⁰ Cf. Plutarch's sad explanation of the impotence of Anaxagorean meteorology against current superstition (*Nicias* 23. 2): οὐτ' αὐτὸς ἦν παλαιὸς οὔτε ὁ λόγος ἐνδοξος.

³¹ *Aphanes* here not "unintelligible" but "hard to understand," i.e., discernible, but only to the most penetrating view, as in Herachitus Frag. 54 (Diels): ἀρμονίῃ ἀφανῆς φανερῆς χρεῖται. To empirically minded doctors, the whole of *physiologia* seemed an excursion into the *aphanes* (see *Ancient Medicine* 1; even the dogmatic theorist of *Nature of Man* affects the same view in chap. 1).

³² Theognis' parallel throws further light on the sense of *gnōmosunē* in Solon's Frag. 16; it is "practical" knowledge, through it one keeps clear of *hubris* and *koros*. Like *sophiē*, *gnōmosunē* (or *gnōmē*) has a *metron* (Frag. 16. *gnōmosunēs* . . . *noēsai metron*), and to know this *metron* is to have skill in action (cf. the poet in Frag. 13: *sophiēs metron epistamenos*).

³³ Here, as elsewhere (e.g., Frag. 10: *sumpusin d' humin*), Solon makes a significant assumption: all Athenians are expected to think about the common good. Antidemocratic regimes typically assumed the reverse: e.g., the herald in Euripides *Suppl.* 420–22: γαῖονος δ' ἀνὴρ πένης (as also, no doubt, the ναυτικὸς ὄχλος) . . . οὐκ ἂν δύναιτο πρὸς τὰ κοινὰ ἀποβλέπειν.

³⁴ Just such a relation of expert to laymen is assumed in Ionian science. E.g., *Ancient Medicine* 2, it is not easy for *dēmotai* to understand the nature and cause of their ailments: ὅπ' ἄλλου δὲ εὐρημένα καὶ λεγόμενα, εὐπετές. οὐδὲν γὰρ ἕτερον ἢ ἀναμνήσκεται ἕκαστος ἀκούων τῶν αὐτῶ συμβαινόντων. The last statement fits exactly Solon's political discourse: to get his point, the Athenians need only take stock of *ta autois sumbainonta*. Herachitus is impatient with his fellows because they cannot understand their own experience (Frag. 17 [Diels]: ὁκόσοις [so Wilamowitz] ἐγκυρεῖσιν; Frag. 72 [Diels]. οἷς καθ' ἡμέραν ἐγκυροῦσι) after he has explained it all to them (Frag. 1 [Diels]. πειρώμενοι καὶ ἐπέων καὶ ἔργων τοιούτων ὁκοίων ἐγὼ διηγέσκα).

³⁵ *Es meson*. In Herodotus, *es meson tithēmi* means to "put anything into a common pool." He uses it for the transfer of political authority from the hands of king or tyrant into the hands of the people (e.g., 3. 142: ἐγὼ δὲ ἐξ μέσον τὴν ἀρχὴν τιθεὶς ἰσονομίην ὑμῖν προαγορεύω, cf. 3. 80 and 4. 161–15; *es to koinon* has exactly the same sense in 3. 80).

B. The Common Peace

Peace (*hēsuchiē*) and its opposite, disturbance (occurring in the fragments only as a verb, *tarassō*) are matters of ordinary experience. They can be annexed to the domain of magic, as we have seen above. But taken by themselves they belong to the commonsense naturalism of Greek thought. Thus they play an enormous role in Hippocratic medicine. There, next to *krasis* itself, *hēsychiē* is the most general attribute of health.³⁶ *Krasis* is [68] clearly the more technical concept, worked out in conjunction with Ionian and Italian physics. It is then fair to assume that *hēsychiē* is the prior notion and, as such, the earliest empirical characterization of health, emerging side by side with magical ideas and surviving when these were sloughed off. Thus Solon's only medical allusion refers to the sick as "disturbed"³⁷ (Frag. 13. 61). This reminds us of the "disturbed" sea in Fragment 12 and again of the political "stirring-up"³⁸ which gives the would-be tyrant his chance to skim off the cream of state power. As we saw in Fragment 12, *hēsychiē* was "just" for the sea, i.e., the state that keeps the measure of its proper nature; disturbance would be "excess." That *hēsychiē* has the same sense in politics is clear from Solon's exhortation to the nobles:

Still [*hēsuchasantes*] the strong heart within your breast,

You who have forced your way to good things in excess [*es koron*],

Put your proud [literally, "great"] mind within the measure.³⁹

And it is further confirmed in Fragment 4, which explicitly contrasts "quietness of life" (*daios en hēsuchiēi* [line 10]) with *hubris* and excess (*koros*).

Hence the significance of Solon's reference to *stasis* and war. A lecture on the evils of civil strife would be superfluous for a Greek audience. The point of Solon's message is rather to fix imaginatively a frame of reference within which the occurrence and effects of *stasis* could be properly appreciated. *Stasis* is not an isolated event that comes only when willfully fomented by the

As the opposite of *tarachē*. See below, n. 38. *Tarachē* versus *hēsuchiē* corresponds to *metastasis* versus *katastasis*: the unsettling of the normal condition versus the return to normal. E.g., *The Iliad* 14. 26–28 (Loeb *Hippocrates*, Vol. 2, p. 250, ed. W.H.S. Jones). ἦν μὲν οὖν τοιοῦτος, ἅπαν ἀναταραχθὴ τὸ αἷμα, παντελῶς ἡ φρόνησις ἐξαπτόλλυται; and 14. 63–64. καταιστώντος τοῦ αἵματος, . . . πέπαιται τὸ νόσημα. It is significant that *katastasis* comes to mean not only the process of "quieting down" into health but, far more broadly, the constitution itself, whether of the human body, of the seasons, or of the body politic, each of which is a *katastasis* (see examples in *LSJ*, s.v. II, 2–3).

³⁷ Literally "stirred up," *kukōmenon*. Cf. the hendiadys in Aesch. *PV* 994. κυκάτω πάντα καὶ ταράσσει τοι.

³⁸ Frag. 37: *anataraxas*. For Hippocratic usage cf. οὐρα ἀναταραχμένα (*Aphorisms* iv 70), κοίτη ταραχώδης or ἐπεταράχθη (frequently in *Epid.* i and iii); τὰ τῆς γνώμης ταράσσεται (ibid. 3. 8).

³⁹ Frag. 28c: with μέτροισι, the Kaibel-Wilamowitz reading, followed by Edmonds, in place of μετρίοις of the papyrus.

"lover of dread civil strife" (*Il.* ix. 64). It is an integral part of a breakdown of the state of social well-being, which Solon called *eunomia*. Consequently, (1) any act of injustice, impairing the "good order," "good sense," and "soundness" of the common life, is a real, though quite likely unintentional, cause of civil strife;⁴⁰ and (2) the distemper of the body politic, evidenced by *stasis*, is all-comprehensive in its effects. It is a "plague which comes to all the city" (*Frag.* 4. 17); a "public calamity which comes home to everyone," invading the private security of the family. Therefore, any act of injustice, impairing the common security, threatens everyone's individual security—and family solidarity can interpose no effective protection.⁴¹

This thought has momentous implications. It says in effect: a direct injury to any member of the *polis* is indirectly, but no less surely, an injury to every member of the *polis*; for, though the initial injustice affects only one or a few, the eventual effects on the common well-being imperil everyone's welfare; hence anybody's wrong is everybody's business. That Solon himself was aware of just these implications is confirmed by the fact that we find them embedded in his judicial reforms. For the principle of "true criminal law"⁴² [69] is precisely that certain offenses against individuals are not merely private wrongs against the immediate victim but public wrongs against the whole community. And this, as Calhoun has argued, was fully recognized for the first time in Greek history in Solon's legislation enabling any citizen (*ho boulomenos*) to bring action for offenses committed against other persons.⁴³

That certain actions menace directly the safety of the whole community had been felt from the earliest times. Those guilty of such acts were treated as

⁴⁰ The characteristics of *eunomia* which εὐνομία καὶ ἀρετὰ πάντ' ἀποφαίνει (4.33) and makes πάντα κατ' ἀνθρώπους ἀρετὰ καὶ πινυτά (4.40).

⁴¹ *Herkos* and *aulē* for the family and its private sanctities. Schol. on Plato *Euthyd.* 302d: ἔρχη τοὺς οἴκους Ἀθηναῖοι φασι· ἐκ τούτου δὲ καὶ Ζεὺς ἑρκίος παρ' αὐτοῖς, ὃν ἴδρυν ἐν τούτοις φυλακῆς χάριν. For the family as a power which could effectively defy the common justice of the city in early times, see *Od.* 18.139.

⁴² See G. M. Calhoun, *The Growth of Criminal Law in Ancient Greece* (Berkeley, 1927), chap. 4. (I shall refer to this book hereafter simply as "Calhoun.") In spite of his unwillingness to recognize the due place of the doctrine of pollution in the development of Greek criminal law, Calhoun's argument seems to me valid and illuminating. His thesis that "true criminal law" (in his sense of this expression) is a Solonian innovation gears in well with my argument that Solon's whole concept of justice was in no sense a further extension of the doctrine of pollution but a radically new departure.

⁴³ *Ath. pol.* 9. 1; Plut. *Solon* 18. 5. Thereby, Plutarch explains, "the legislator trained the citizens to feel and suffer in unison with each other like members of one body." The organic metaphor is Platonic; but would Plato have thought of applying the schema of organic unity to the judicial procedure of Athenian democracy? The Athenians themselves clearly thought of this as a distinctive feature of their democracy (cf. Demosth. xxi. 45, quoted below, p. xx, and Hyperides *Frag.* 11 [col. 8], who asks of this procedure, τί ἐν τῇ πόλει βέλτιον ἢ δημοτικώτερον;). For the opposite conception, see Xenophon *Const. Lac.* 10. 6: "For he [namely, 'Lycurgus'] believed that enslavement, fraud, robbery, wrong only the individuals who are injured" (τοὺς βλαπτομένους μόνον ἀδικεῖσθαι).

outlaws and could be killed by anyone without endangering the killer (*nēp-oinei tethnanai*).⁴⁴ The doctrine of pollution created new areas of concern for the public safety and justified new procedures for its protection. Hence the provision of the Draconian law which permitted anyone to slay or commit to the authorities (*apagen* [inf.]) a man who unlawfully returns from exile for unintentional murder (*JG.* 12, 61, lines 30–31). If the second alternative were followed (*apagen*), a public inquiry would probably be held to establish the identity of the prisoner and the fact of his capture on Attic soil.⁴⁵ In this inquiry the captor would act in a genuine, though rudimentary, sense as prosecutor in the public interest.⁴⁶ He could act so precisely because the prisoner "is not prosecuted as a murderer but as polluted person. . . . He is a public menace."⁴⁷

⁴⁴ Calhoun, pp. 66–67.

⁴⁵ Bonner and Smith, I, 121.

⁴⁶ I say "rudimentary" because the returning exile has already been condemned by previous judgment of court; the captor could execute the sentence on the spot. If, alternatively, he is seized and delivered to the magistrates, the captor's initiative in the matter is substantially that of seeing to the execution of the standing verdict. At the public inquiry the captor is also accuser and, in that sense, bona fide prosecutor; yet his contribution is that of depositing information as to matters of fact. Solonian public action, on the other hand, calls for wider initiative: *ho boulomenos* takes it upon himself to interpret the meaning of the law, judge that it incriminates the offender, and assume the responsibility (often with attendant risks) of persuading a court that his judgment is correct.

Bonner and Smith (pp. 122, 168) surmise further than the code's provision against abuse or blackmail of the returning exile, *τ.*, would entail prosecution by *ho boulomenos*. If this could be confirmed, it would provide a thoroughgoing anticipation of Solonian public action. But the hypothesis rests on the assumption that *E* "being [a] polluted and [b] *atimos* was debarred from appearing in court to exact the penalty" (I, 122). Now as to [a], do we know enough of the ceremonial etiquette of purification to validate this assumption? Antiphon explains that homicide courts sit in the open air so that jurors and prosecutors may not be *homorophoi* with the polluted defendant (5. 11). Might not a similar provision suffice to safeguard the ceremonial purity of the court in the present instance? As to [b], again the evidence seems inadequate. What do we know of what the *atimos* could or could not do in such an instance? Reasoning a priori from the fact that he could be killed without so much as bringing blood-guilt upon the killer (Demosth. 9. 43, and cf. the broader formula in the Eretrian inscription cited in *RJG.*, 2, 49: ἔτιμος ἔστω καὶ . . . ὃ ἂν πᾶσι νηποιεῖ παύεται), one would assume that he had no rights whatever. But Draco's code unexpectedly assures him residual rights, such as immunity from personal abuse and blackmail. If these, why not others? Incidentally, there is a simpler reason why *E* would not prosecute of his own accord, no matter how abused, so long as he was still at large, for he could not do so without delivering himself up to the authorities for arrest under the law. So the question is, what form of action would be open (1) after apprehension, to *E*; and (2) before apprehension to any third party, *X*, who discovered *E*'s unlawful abuse by someone else? In the case of (2), *X* would surely first take steps toward *E*'s apprehension. If successful, the case reduces to (1). But if unsuccessful, how could *X* prosecute the party guilty of abuse or blackmail without *E*'s presence to give evidence? There is room here for conjecture by analogy with later procedure. But should we not have more than conjecture as a base for so revolutionary a departure in Attica as prosecution by a third party having no direct connection with the case, not even that of *apagen*?

⁴⁷ Gertrude Smith, in *CP* 17 (1922), 197.

Solon's originality consists in extending [70] the right of public action to cases in which there could be no question of a "public menace" by contemporary standards of pollution or common sense—i.e., to injuries which impinged *only* on the rights of the particular victim and did *not* obviously affect the rights of the community at large. Such offenses as these had been traditionally held to be the private business of the parties directly concerned; Hesiod warns his brother to mind his own business and keep his ears "out of the disputes of the court-house."⁴⁸ Solon's achievement was to break down this way of thinking and validate the opposite assumption that, as Demosthenes was to put it later, "every deed of violence is a common injury, affecting those also who are not directly concerned" (καὶ κατὰ τῶν ἔξω τοῦ πράγματος [xxi. 45]). This is a revolutionary departure. It was made possible by Solon's subtler, deeper concept of social solidarity, which discovered a public import even in private wrongs against private persons.⁴⁹ The doctrine of pollution had proved incapable of this advance—witness the fact that under its influence homicide remained through the classical period a private wrong, actionable only by the family of the victim! The advance was made possible through a clear insight into the causal connection of any act of injustice with the common peace and well-being.

⁴⁸ *Op.* 27–32. I follow Bonner and Smith's rendering for *neike' agorēs*.

⁴⁹ I say, "made possible," not "caused," for I am discussing ideology, not social dynamics. Something will be said about the latter in due course; but the paper is a study in ideology, and the references to the causal framework will be only incidental. Meanwhile, I hope that I shall not be credited with the naïve assumption which Ranulf (*The Jealousy of the Gods* [London, 1933–35]) imputes to Calhoun and others: that the cause of the institution of the Solonian *graphē* was nothing but the *idea* of the public import of private wrongs. Ideas become political realities only when backed by groups that possess political power. For a causal explanation one should look to the composition of the forces which first challenged (in the great *stasis* of *Ath. pol.* 2.1 and 5.1) and then destroyed (in Solon's archonship) the Eupatrid monopoly of state power.

As for Ranulf's own contribution to the problem, it is a pity that he never distinguished clearly between two problems: (1) how to explain the original institution of the *graphē* and (2) how to explain the fact that, once instituted, the *graphē* worked (on the assumption that it did). Problem 1 is essentially sociological, while 2 is mainly a psychological problem; 1 is a function of the changing relationships of social classes under changing historical conditions; 2 is a function of the probable motives of individuals under those circumstances. Ranulf's theory of "disguised envy" is largely irrelevant to problem 1, it is substantially an answer to 2. But even here it remains to be shown that "disguised envy" is not only a motive (which I, for one, would readily grant), but *the* motive—i.e., so much more powerful and more prevalent than other motives impelling Athenians to take the initiative of the *graphē* that it alone "explains" why the *graphē* really worked. Ranulf makes no serious effort to consider these other motives and assesses their weight, and this, because of an assumption which determines his very formulation of the problem: "what can have induced Athenian citizens thus regularly, *without benefit to themselves* [my italics], to invoke the law for the protection of others?" (I, 11). Why assume that, in the absence of a lawyer's fee or state salary, the prosecutor would get no "benefit" and be purely "disinterested" in the act—this among a people so avid for *kudos esthlon* (Solon Frag. 19), and for the power to be "sweet to one's friends, bitter to one's enemies" (Solon Frag. 13. 5)?

Next to the right of public action, Aristotle mentions Solon's introduction of "the appeal to the *dicastērion* to which the masses have owed most of their strength."⁵⁰ This included (1) the admission of every citizen as a member of some court of justice—presumably the assembly itself, acting in a judicial capacity,⁵¹ and (2) the right of appeal to this court from the decisions of the magistrates.⁵²

We may cite precedents for both of these advances: Point 1 is rightly interpreted by Bonner and Smith as "a rehabilitation and reorganization of the [71] Homeric *agora*" (I, 166); Point 2 may well have been inspired by contemporary experiments in the Ionian laboratory of democratic politics. The well-known Chian decree provides for appeals from the decisions of magistrates to the final judgment of a "public council."⁵³ But Solon again outdistances his precedents. Appeals to an assembly which included of right all citizens⁵⁴ is a very different matter from appeal to a court of elected officials.

The precious right of "straightening crooked judgments" now ceases to be the exclusive privilege of public officials—whether these be the nobles of the Homeric and later aristocratic period or even the elected council of more democratic times. It now belongs in principle to the people as a whole. Here again Solon's statesmanship is true to the logic of his position as here interpreted: injustice, a public evil, affects everybody; therefore, justice, a public necessity, is everybody's business. The most radical institution of fifth- and fourth-century Athens—the public *decasteries*—is no more than a literal application of this very principle. Solon certainly did not envisage anything so

⁵⁰ *Ath. pol.* 9. 1.

⁵¹ *Ibid.* 7. 3. 9. 1–2. cf. *Pol.* 1274a3, see also Bonner and Smith, I, 153–59.

⁵² It is now the people's turn to "straighten" justice. Cf. *Pol.* 1274a16: τὸ τὰς ἀρχὰς ἀλγεῖσθαι καὶ εὐθύνειν and 1281b35: ἀρχαιτελείας καὶ εὐθύνας τῶν ἀρχόντων (It is not necessary to assume that *euthunein* meant in Solon's time the regular audit of returning magistrates [see Gilliard, *Quelques réformes de Solon* pp. 288–89, and Bonner and Smith, I, 164–65].) Here, once again (see, above, n. 33), Solon denies in principle a basic antidemocratic dogma (cf. Eurip. *Suppl.* 418).

⁵³ No. 1 in M. N. Tod, *A Selection of Greek Historical Inscriptions* (Oxford, 1933). I say "final judgment" on the strength of *epithōios* in line 18, which I interpret with Tod, in the active sense, "with power to inflict penalties." The "public council" of this inscription is an elective body able τὴν ἄλλα προῆσσειν τὰ δῆμου καὶ δίκας ὁμῶσαι (lines 19–20).

⁵⁴ Aristotle *Pol.* 1274a3. τὰ δικαστήρια ποιήσας ἐκ πάντων. Certainly there is no property qualification; what of an age qualification? Bonner and Smith (I, 162) think it unlikely since none is mentioned in our sources. But this, of course, is not conclusive, especially (1), as Bonner and Smith point out (I, 162n 1), no age qualification is mentioned for the Solonian *boulē*, while the Cleisthenian is known to have excluded men under thirty, and (2) there was the well-known age limit of thirty for jurors later on (*Ath. pol.* 63. 3). A more "extreme" democracy would be more likely to reduce age limits than to increase them. On the other hand, Bonner and Smith's position on this point follows from their other assumption, reasonable enough (see above, n. 51), that assembly and Solonian popular court consisted of the same people. In any case, the issue is of no great consequence for my argument. An age limit of thirty, if it did exist, would scarcely affect the democratic complexion of the Solonian popular court.

extreme. But history has a way of carrying the logic of an idea far beyond its author's intentions.

Without attempting a complete analysis of Solon's constitutional changes,⁵⁵ we may notice, finally, one of the oddities in his reform-program which is without known precedent or parallel: "he who will not take arms with either party when the *polis* is in a state of strife, should be disfranchised and have no share in the *polis*" (*Ath. pol.* 8. 5, and parallel references as cited by Sandys, *ad loc.*).⁵⁶ "He intends apparently," Plutarch interprets, "that no man should be insensible or indifferent to the common weal, making his private affairs secure and flattering himself that he does not share the pain and sickness of the fatherland, . . ." (*Solon* 20.1). This is flowery language; but the thought is true to the concept of civil strife as we have found it in Solon's poems: Strife is no mere private dispute; it is the end-product of *hubris*, which disrupts the common well-being; neutrality in such a matter is impossible, except for one who wilfully abstracts himself from the common life. [72]

C. The Common Freedom

So it is with his concept of freedom. This, too, is felt as the common concern of the *polis*, because the bondage of anyone endangers the freedom of everyone. Thus the bondage of the *hektēmoroi* is not viewed as their individual misfortune but as the common disaster of the *polis*. It is the "land" ("Black Earth, great mother of the Olympian gods" [Frag. 36. 4–5]), which is "enslaved" by the "ward-posts" (*horoi*) and must therefore be "freed." The point at issue here requires a clear understanding of the historical facts to which Solon refers in this poem: the interpretation of these facts, the fruit of painstaking and imaginative scholarship, may be summarized as follows:⁵⁷

The sale of the ancestral lot (the *klēros*) was prohibited in pre-Solonian

⁵⁵ *Eisangelia* would be specially worthy of notice in a more exhaustive study. Before Solon it meant "denunciation of private wrongs by the wronged" (*Ath. pol.* 4.4). Solon extended it to offenses which were in no sense private injuries but only threats to the security of the constitution: τοὺς ἐπὶ καταλύσει τοῦ δήμου συνισταμένους (*ibid.* 8. 4, though the phrase ἐπὶ καταλύσει τοῦ δήμου is certainly post-Solonian; there is no reason to think that Solon would refer to the government as *dēmos*; see below, p. 82). The implicit logic of private prosecution for a public danger is, once again, the solidarity of "our" *polis*.

⁵⁶ This is sometimes rejected on the ground that it is never invoked by the orators (Gilliard, *Quintus reformes*, p. 292). It would then have to be an invention of Aristotle or his source. Yet fourth century conservative circles can hardly be considered enthusiasts for universal participation in *stasis*! Their motto would be rather *hēsuchia, apragmosunē* (Isoc. *Antidosis*, 151). Their Theramenes was held up as a man who could be a loyal citizen under any constitution: ὅπερ ἔστιν ἀγαθὸν πόλιντος ἔργον (*Ath. pol.* 28.5).

⁵⁷ Following Woodhouse (above, n. 3), and Naphthali Lewis, "Solon's Agrarian Legislation," *AJP*, 62 (1941), 144–56. Their interpretation is ingenious, well thought out, and makes good sense from every point of view. Much of it rests on tenuous evidence, but it must be accepted in the absence of a more satisfactory construction of the data (see also below, n. 93).

Attica. But a loophole in the law had been found through what later came to be called "sale with option of redemption" (*prasis epi lusei*). This permitted the peasant to borrow money, on condition that, pending redemption of the loan, he would pay the creditor a fixed proportion of the yearly produce. Thus the creditor got not only a yearly income but also a hold over the labor of the debtor, who remained on the land "as life tenant of what had been his ancestral holding."⁵⁸ Lewis points out that the peasant's promise to deliver the fixed annual payment itself required real security; since land was inalienable, the peasant had to offer his own person (and/or that of his family) as security at the time of the original contract. His creditor then could hold over him the constant threat of selling him off into slavery and therewith had "a control in effect if not in law of the debtor's person and actions."⁵⁹ Of this "most harsh and bitter bondage" (*Ath. pol.* 2. 3), the ward-stones were the visible sign. And this is what Solon ended when he abolished retroactively all debts on the security of the debtor. Deprived of their real security, the agricultural debts could not be enforced, ownership reverted to the peasant, and the ward-stones could be "pulled up" (*aneilon* [Frag. 36. 6]).

So when Solon speaks of the "land" as "enslaved" by the ward-stones, he thinks of the land whose incumbrance by debt entailed the subjection of the peasants. This is the peasant's land. Yet he equates the bondage of *their* land to the bondage of *the* land, i.e., the fatherland.⁶⁰ How explain this tremendous assumption? Only by comparing "enslavement" in this fragment with the different, though related, sense of "enslavement" in Fragments 9 and 10, where it clearly means the subjection of the whole city—poor and rich alike—to a tyrant. How does the city fall into such a fate? Because, as we know from history,⁶¹ it was divided within. Wherever there is "disturbance," there the would-be tyrant gets his chance.⁶² Thus the logic of history justifies Solon's assumption that the enslavement of the *hektēmoroi* is tantamount to the enslavement of the *polis* itself; for history showed that there could be no peace in Attica if the peasants were oppressed. They had power enough to make *stasis*, and this would rob the whole *polis* of its freedom. [73] Freedom must either be enjoyed in common, or else it would be lost in common. The *polis* is one, and its freedom is indivisible.

The most important of all of Solon's reforms is a direct application of this view of freedom: If the freedom of each is the concern of all, then the *polis*

⁵⁸ Woodhouse (above, n.3), p. 111.

⁵⁹ Lewis, "Solon's Agrarian Legislation," p. 150.

⁶⁰ For *gē* with the sense "state" and/or "fatherland," see Frag. 28a πρεσβυτάτην . . . γαίαν 1. οὐκ ἔστιν ἐν τῇ γῇ ἐφεισάμην πατρίδος . . . , Frag. 34: πείρας χθονὸς πατρίδος. Cf. also Callinus Frag. 1. 7; Tyrtæus Frag. 9.34 (Diehl); Theognis 1214. Cf. also the original sense of *dēmos*, "country" (below, n. 115).

⁶¹ *Ath. pol.* 13.

⁶² Frag. 37. To be sure, in Frags. 9 and 10, Solon attributes "bondage" to ignorance; but this is elliptical, stressing one aspect of the conditions which lead to tyranny.

must protect everyone against personal enslavement, even to the extent of ransoming, with state funds, Athenians who had already spent many years as slaves in other lands.⁶³ Thus he "liberated the commons once for all" (*Ath. pol.* 6. 1). But more than this was required. As a protector of the common liberty, the *polis* could brook no rival; it had to curb the power of the noble clans to secure a privileged freedom within their own proud circle. The judicial reforms already mentioned struck a heavy blow against their monopoly of state power. But there were others:

1. Eligibility to public office had been a matter of noble birth; Solon made it a matter of property.⁶⁴

2. Appointment to office had been made by the sole authority of the Areopagus (*Ath. pol.* 8. 2); now it became a matter of sortition from panels elected by the tribes.⁶⁵

3. The Areopagus itself was further weakened by the creation of a new council of four hundred, "one hundred from each tribe" (*Ath. pol.* 8. 4); its powers included the probouleutic function which in Sparta belonged to the senate and the kings (Plut. *Lycurgus* 6. 4).⁶⁶

4. Conspicuous displays of the power and prestige of the noble families were scaled down in two important matters: the conduct of funerals and the public honors accorded to athletic victors.⁶⁷ [74]

⁶³ Frag. 36. 8-9. The use of state funds, is, of course, only an inference; but how else could they be "brought back"?

⁶⁴ *Ath. pol.* 7. 3: "To each class he gave office in proportion to its *timēna*."

⁶⁵ *Ibid.* 8. 1. The mode of election is unknown. We may assume that every member of the tribe had a vote. But the *phyllobasileus* was a Eupatrid (Pollux vii. 111), and this would no doubt give the aristocrats advantages in the electoral process.

⁶⁶ Plutarch mentions its probouleutic functions (*Solon* 19. 1) but says nothing to preclude other powers. It seems unlikely that the earlier Council of 400 was limited to *probouleuein* (important as this was), if the Cleisthenian Council of 500 was, in its inception, "virtually the sovereign body of the state" (Bonner and Smith, I, 342). If it was the Solonian *Boulē* of 400 that headed the democratic forces in the struggle of 508-507 B.C. (*Ath. pol.* 20. 3; Hdt. 5. 72; P. Cloché, *REG* 37 [1924], 1-26), it would follow that its constitutional powers were wide and that it was in some sense a democratic counterpoise to the Areopagus. Plutarch thinks that the *Boulē* of 400 was conceived as a brake upon the "boldness" of the *dēmos*. But if this was Solon's object, why create a new body? The magistrates and/or the Areopagus could have served the purpose. Freeman (above, n. 3), p. 73 thinks that the probouleutic function had been exercised by the presiding officer, the archon eponymus. This is a natural enough supposition. But in Sparta this power belonged to the senate along with the kings (Plut. *Lyc.* 6). By analogy we should assume that in Athens it would belong to the Areopagus along with the archon eponymus and perhaps others of his fellow-archons. Aristotle's phrase τὴν μὲν τάξιν εἶχε τοῦ διατηρεῖν τοὺς νόμους (*Ath. pol.* 6. 6) is certainly broad enough to include *probouleuein*. The Areopagus's general guardianship over the state would of itself make a good peg on which to hang the claim to examine any matter that was to come before the Assembly.

⁶⁷ The political import of Solon's regulation of funeral ceremonies has been noticed (e.g., Glotz, *Histoire grecque*, I [Paris, 1925], 434. L. Gernet and A. Boulanger, *Le Génie grecque dans la religion* [Paris, 1932], pp. 160-61). But perhaps something remains to be said on the boldness of Solon's move, imposing the rules of the city upon matters which fell so definitely

No less significant were two further classes of reforms, whose erosive effect on the old order was bound to be most damaging upon the noble families who had been its chief beneficiaries. The first of these conferred the heretofore unheard-of freedom to bequeath land outside the *genos* in the absence of legitimate male issue.⁶⁸ This, says Plutarch, "made a man's possessions his own property" (*Solon* 12. 2).⁶⁹ The second seriously reduced the father's ancient power of life and death over his children: He could no longer sell wife or child into slavery, or expel at will a son from the household, or exact from him any deference beyond that of food, clothing, and an honorable burial.⁷⁰

and a Eupatrid exegesis (cf. *Athen.* 10. 410 a). Less attention has been paid to Solon's "curtailment of the honors of athletes" (Diog. Laert. I. 55. cf. Plut. *Solon* 23. 3. Diod. Sic. 9. 2. 5), which included (1) fixing a scale for the city's "gift" to athletic victors and (2) regulating the public meals to which, by a widespread Greek practice (Xenophanes Frag. 2. 8-9), victors were entitled (Plut. *Solon* 24. 3 is not very definite; *Athen.* 4. 137e suggests that the fare was simplified). Bowra ("Xenophanes and the Olympic Games," *AJP* 59 [1938], 263) thinks it may be reasonably doubted whether "in earlier centuries athletic renown was so universally prized by aristocrats" (i.e., as in the fifth century). But that it was prized highly enough is clear from his own interesting observations (*ibid.*, pp. 265-66). Solon the merchant confronted a tradition which, since Homer (*Od.* 8. 159ff.), had exalted the aristocratic sportsman at the expense of the "greedy" merchant. It would be strange if this tradition were anything but strong during the seventh century, when new athletic events were being introduced at the Olympic games and when the Isthmian, Isthmian, and Nemea were so growing in popularity that, within three decades after the turn of the century, all three were reorganized as pan-hellenic festivals (E. N. Gardiner, *Athletics of the Ancient World* [Oxford, 1930], pp. 357-77). Bowra's doubt is prompted by the views of Solon, Tyrtaeus, and "Pythagoras." To the last of these I can attach no weight in a matter which calls for historical evidence. As for Tyrtaeus, he was surely trying to exalt in Sparta (as Solon did in Athens) the "common good of the *polis*" (Frag. 9. 15 [Diehl]: *ἑνὸν δ' ἐσθλὸν τοῦτο πόλιν τε παντὶ τε δήμῳ*) as against the private ambitions of the nobles and their families. Certainly the Sparta of Tyrtaeus was no democracy. But neither did Tyrtaeus speak as an "aristocrat"; he was a spokesman for the cohesive nationalism of the new Sparta of "Lycurgus." His reforms, he was undercutting the system of values of the old regime, where the glory of the *genos* must have reigned supreme. As for the political implications of Olympic victory in seventh-century Athens, the only attempt at "tyranny" of which we know there was made by Cylon, and *Olympionikēs* (Hdt. 5. 71. Thuc. I. 126. 1). Finally, it is worth noting that if, as McGregor suggests ("Cleisthenes of Sicyon," *APA* 72 [1941], 266-87, at 280), the addition of gymnastic contests meant a certain democratization of the games, the shift apparently came only *after* Solon's archonship (Paus. 10. 7. 5 speaks of the addition of footraces as a Pythian innovation in 586 B.C.); if so, Solon was dealing with an institution which was still solidly aristocratic.

See references in Glotz, *Solidarité de la famille* (Paris, 1904), p. 342n. 3 and p. 343n. 1. Freeman (above, n. 3) p. 115 thinks that "the real purpose" was "to prevent the dying-out of the family." But Solon's legislation was permissive (*exemai*), not compulsive. Its point is surely the power it confers on the testator to cut out any member of his *anachusēa* (other than his own legitimate sons) in favor of an outsider. This adds greatly to the testator's freedom of choice, while safeguarding the continuity of the family.

⁶⁹ There is no explicit reference to sale in any of the numerous texts that attest the Solonian institution of the freedom of bequest. *Donnai* need not imply "sale" (cf. *Pol.* 1270a20 [of Sparta]: *ἀνεῖσθαι μὲν γὰρ ἢ πωλεῖν τὴν ὑπάρχουσαν ἐποίησεν οὐ καλόν, . . . διδόναι δὲ καὶ καταλείπειν ἐξουσίαν ἔδωκε τοῖς βουλομένοις*).

Glotz, *Solidarité de la famille*, pp. 351-68.

To claim, as Glotz does, that "through the entirety of these laws the solidarity of the *genos* was now broken once for all, and its power received a fatal blow"⁷¹ is to indulge in rhetorical overstatement. The Eupatrid families survived the Solonian reforms with such power, sacred and profane, as only a "tyrant" could successfully oppose.⁷² The drastic measures of Cleisthenes were required to make constitutional democracy safe against the Eupatrids. Nevertheless, Glotz is right in making Solon the watershed of Athenian history. Before Solon the Eupatrid families *were* the state. After Solon they are only the strongest of the contestants for power within the state. Solon came far short of establishing liberty on equal terms for all; and we shall see that he had no intention of doing so. But he did break the monopoly of freedom hitherto held by the nobles. He did secure for the masses a modest and, as he believed, "sufficient"⁷³ share in the common freedom of the *polis*.

II. THE JUSTICE OF WEALTH

A. The Bifurcation of Justice

Does the same justice that regulates political action extend also over the pursuit of wealth? So one might think from the opening lines of Fragment 13. The wrongdoing of individual money-grabbing is described here in words which are strikingly similar to those used of the class-covetousness and *hubris* of the nobles in Fragment [75] 4.⁷⁴ And both are followed by justice exacting the same "inevitable" reparation.⁷⁵ But here the identity ends:

1. There is no suggestion that in the case of wealth the sequence of "injustice" and "reparation" is a natural, self-regulative process. There is no parallel here to the observable chain of consequences (injustice—bondage—strife) which we met in the account of political justice, hence no explanation as to *how* the original injustice leads to "disaster" (*atē*)

2. For all of Solon's initial assurance that unjustly got wealth will not last (Frag. 13. 11–13), he is promptly forced to admit that it may well outlast the life of the unjust man himself; the pursuing justice may only catch up "with the innocent, their children or their seed after them" (lines 31–32).

⁷¹ *Histoire grecque*, I, 434. By *genos* here he means "family."

⁷² Woodhouse (above, n. 3), p. 138 calls attention to the striking words of Hdt. 6. 35: εἶχε μὲν τὸ πᾶν κράτος Πεισιστρατός, ἀτὰρ ἔδυνάστανε γὰρ καὶ Μιλτιάδης ὁ Κυψέλου ἑὼν οἰκίῃς τεθρο. πποτροφοί

⁷³ Frag. 5. 1: *geras hosson uparkei*

⁷⁴ Cf. *adikos noos* and *adikous ergmasi* in 4.7 and 4.11 with *adikos* and *adikois ergmasi* in 13.7 and 13.12, *hubrios* in 4.8 and 13.11, *kosmein* in 4.10 with *ou kata kosmon* in 13.11

⁷⁵ Cf. 4. 16: τῷ δὲ χρόνῳ πάντως ἦλθ' ἀποτεισομένη with 13.8. πάντως ὅστερον ἦλθε δίκη (cf. 13. 30–32), also with 13.25: Ζηνὸς τίσις and with 13.29. ἀλλ' ὁ μὲν αὐτὶς ἔτεισεν, ὁ δ' ὅστερον

This last is a most significant admission. It harks back to a nexus of ideas which had been left behind by Solon's concept of political justice (see above, Part I, Sec. A). For nothing is so characteristic of the magical view of justice as the postulate that punishment descends biologically upon the sinner's posterity. We have already seen in Hesiod how a man's sin carries with it the extinction of his *genos*.⁷⁶ Almost every recorded curse calls down perdition on the *genos* as well as on the guilty man himself.⁷⁷ The hereditary transmission of guilt is championed by Delphi⁷⁸ and figures prominently in the doctrine of purification: thus the Cylonean stain descends to successive generations after the event.⁷⁹ Yet here is something that baffles the sense of justice of the Greeks. They cannot justify the necessity that children should "pay back" the sins of the fathers.⁸⁰ Nor can they see here one of those postulates which, groundless in themselves, at least offer ground for the orderly comprehension of other facts. On the contrary, the inheritance of guilt makes the moral equation less soluble than ever, loading it with unknowns and unknowables from the long-vanished past.⁸¹ That Solon should have to fall back on this very dogma shows how far his view of the justice of wealth has lagged behind his concept of political justice.

I see no way of getting around this bifurcation in his thought. In political justice he is a great innovator, for he thinks of it as an intelligible order of reparation. In acquisitive or distributive justice, he is a traditionalist, as Maurice Croiset was the first to observe.⁸² If Fragment 13 were all [76] that survived of Solon's verse, we should be unable to credit him with any advance over Hesiod; for his sense of justice would resolve, like Hesiod's, into the

⁷⁶ See above, n. 15. Cf. also *Op.* 320ff., where ruin of the *oikos* is attached to unjust acquisition of wealth by formally equating this with crimes against the traditional sanctity of suppliant, stranger, orphan, and parents (lines 327–32)—all of which bring down the personal displeasure of Zeus (cf. also *ibid.* 284–85, for the perjurer).

⁷⁷ E.g., Aeschines 3. 111 (cited above, p. 66); Antiphon v. 11; Andocides I. 126; Lysias 6. 20; Demosth. 23. 67; Lycurg. *Leocr.* 79; and the curses cited by Robert (above, n. 10), p. 313nn.2 and 3

⁷⁸ E.g., the story of Glaucus in Hdt. 6. 86, quoting Hesiod's *Op.* 285 in the last line of the Delphic oracle; cf. also Hdt. I. 191, where Croesus is punished for the sins of his fifth ancestor. Other examples are cited by Glotz, *Solidarité de la famille*, p. 564

Hdt. 7. 72; Thuc. I. 126. 11–12

⁷⁹ E.g., "Theognis" 731–52, Eurip. *Hippol.* 1378–83. Cf. also Hdt. 7. 137: if justice had fallen on Sperthias and Bulis, this would be "only justice" (*to dikaion*), but that it should fall on their children, δῆλον ὅν μοι ὅτι θεῖον ἐγένετο τὸ πρῆγμα

⁸⁰ For the resulting sense of insecurity, see Aesch. *Eum.* 931–34: he who has not been able to propitiate the Erinyes "knows not whence come the blows that strike his life. For his fathers' crimes deliver him into their hands"

⁸² "La Morale et la cité dans les poésies de Solon," *CRAI* (Paris, 1903), pp. 581–96. However, I see no warrant for Croiset's assumption that the traditional ideas in Frag. 13 are due to the immaturity of Solon's earlier thinking and are presumably sloughed off in his mature view of justice. As I shall explain shortly, the philosophy of wealth in Frag. 13 becomes itself the basis of the Solonian view of the social classes in their mutual relations in the state

pious faith that "justice will triumph over *hubris* in the end."⁸³ But this faith would have nothing more than piety to vindicate its truth. It would be sadly embarrassed by the fact that the unjust so often prosper more than the just. It would then have to be propped up by an appeal to the inscrutable *moira*, which gives and withholds punishment in ways which transcend our comprehension.

The best confirmation of this reversion to Hesiod is to note how faithfully it is reflected in a doctrine which may be taken as the touchstone of any Greek worldview: the doctrine of *technē*. The arts of fire—which symbolize the whole of man's endeavor to change his *moira* for the better by the skillful adjustment of means to ends—appear in Hesiod as a futile effort to circumvent the omnipotence of the gods. Zeus laughs: "As the price of fire I will send them an evil (*sc.* Hope) in which they may all be glad of heart, loving their own misfortune" (*Op.* 57–58). For Solon, too, hope is self-indulgent illusion.⁸⁴ Merchant and farmer are classed with the masters of the arts—craftsman, poet, doctor, *mantis*⁸⁵—with the gloomy reflection that there is no "end" to *technē* just as there is no "end" to wealth.⁸⁶ The end of *technē* and the end of *moira* are incommensurable. The first is immanent and comprehensible; the second is transcendent and incomprehensible; and the first is always at the mercy of the second.⁸⁷ *Technē* cannot undo what is fated to be (*Frag.* 13, 55: *ta morsima*).

Wealth belongs to this realm of *moira*, whose reason, known to God, is

⁸³ *Op.* 217. ἐς τέλος ἐξελοῖσθαι, cf. Solon *Frag.* 13.28: ἐς τέλος ἐξεφάνη and *ibid.* 8: πάντως ὕστερον ἢ λυε Δίκη.

⁸⁴ *Frag.* 13. 36. χάσκοντες κοῦφαις ἐλπίσι τερόμεθα. Cf. Hesiod *Op.* 58. τέρωνται κατὰ θυμὸν ἔδον κακὸν ἡμφαγαπῶντες; and Semonides of Amorgos, *Frag.* 29 (Diehl): κοῦφον ἔχων θυμὸν πόλλ' ἀτέλεστα νοεῖ.

⁸⁵ A significant omission here (and also in Aeschylus' account of *pasai technai* [*PV* 441–506]) has hitherto passed unnoticed: there is no mention of any political *technē* (king, judge, soldier, etc.). *Per contra*, *agorai boulēphoroi* in *Od.* 9.112 in close association with the agricultural and industrial arts (similarly in *Soph. Ant.* 353).

⁸⁶ Cf. line 58: καὶ τοῖς οὐδὲν ἔπεισι τέλος (of doctors and presumably also of the previously mentioned *technai*) with line 71: πλούτου δ' οὐδὲν τέμα. Bowra (*Early Greek Elegists* [Cambridge, Mass., 1938], pp. 96–97) makes the interesting observation that craftsman, poet, doctor, and seer are implicitly bracketed off from merchant and farmer by references to (1) knowledge or skill and (2) divine patrons. One might add that the mechanical arts were for the Greeks the characteristic instance of *telein* (e.g., *Od.* 6.232–34). This makes the ominous reflection, in line 58, all the stronger. With their *technē* and divine patron, craftsman, poet, doctor, and seer are in the same boat with merchant and farmer. Bowra suggests that only the latter two, because of the peculiar uncertainty of their quest for gain, are "related to the victims of *atē*" (*Early Greek Elegists*, p. 97). But the lines immediately following (63–70) are perfectly general; there is no suggestion that they refer to the *technai* any less than to anyone else; "all works" (*pasi . . . ep' ergmasi* [line 65]) refers just as much to the works of the *technai* (the *erga* of Athena and Hephaestus in line 50 and the *ergon* of Paeon in line 57) as to the works of merchant or farmer.

⁸⁷ See lines 59–70, following out the idea καὶ τοῖς οὐδὲν ἔπεισι τέλος in line 58 and then passing to the complementary idea that the *telos* belongs to *moira*.

hidden from us. God gives riches (line 74). This does not mean that we should not go after them on our own account. It means only, as in Homer, that what we have at any moment of our life should be regarded as the will of God, and piously acquiesced in as such.⁸⁸ Man has no rational standard of his own by which to question, far less condemn, the justice of the divine dispensation.⁸⁹ Nor has he any means of knowing how long the award of fortune, good or bad, will last. A good conscience is no protection against the "ruin" which may [77] lurk in the best of fortune;⁹⁰ for one may have to pay for the sins of a remote ancestor. If we may judge from the stories in *Hdt.* i. 30ff., this sense of the capricious reversibility of fortune was a feature of Solon's thought that made a deep impression upon his own contemporaries and became a leading motif in the stories that gathered around his name.

Solon's pious pessimism moves finally toward a goal that had already been reached by the more profane pessimism of earlier Ionians. If the outcome of all striving is insecurity, then seek security in the enjoyment of the moment, which looks to no end beyond itself. "Rejoice your own heart," says Minnemeus (*Frag.* 7 [Diehl]); and Semonides of Amorgos, reflecting on how soon death cuts short men's endless designs, concludes, "thinking of the end of life, give your soul some pleasure" (*Frag.* 29. 12–13 [Diehl]). This hedonism has political uses as yet unexploited; and Solon has his eye on them:

Equally rich are he who has plenty of silver
And gold and fields of wheat-bearing earth
And horses and mules—and he who has but this.
Comfort in belly and sides and feet.

[*Frag.* 24 translation adapted from Edmonds]

This—i.e., all that can be enjoyed at any given moment of one's life—is true "wealth" (*aphenos*). In this respect the peasant is the equal of the great landowner.⁹¹ For the latter's surplus (*ta periōsia*) cannot be converted into immediate satisfaction and can therefore be crossed out of the equation of true wealth. And since the increase of wealth may not keep pace with an even greater increment of desire (*Frag.* 13. 72–73), the quotient of satisfaction may decrease with the accumulation of property and the *pentakosiomedimnos* may

⁸⁸ E.g., *Od.* 6. 188–90.

⁸⁹ *Frag.* 15 is no exception. "Many bad men are rich, many good men are poor." This may look unjust to us, but only because our perspective is so much narrower than the divine, which spans generations. Solon concludes that "we will not exchange virtue for these men's wealth"; rightly so, for "virtue" is humanly "certain" (*empedon*), wealth humanly uncertain.

⁹⁰ I follow Linforth (above, n. 3) in taking *ex autōn* in line 75 to refer to *kerdeia* in the preceding line. The alternative attribution to *thnētois* seems less likely on stylistic grounds and, in any case, solves nothing, for if we rationalize *atē* here, we are still left with the fateful mixture of good and evil in the "unrefusable gifts of the gods" (lines 63–64).

⁹¹ Cf. Solon to Croesus and *Hdt.* 1. 32: "the very wealthy is no better off (*olbiōteros*) than he who has sufficient for the day (τοῦ ἐπ' ἡμέρην ἔχοντος).

be actually "poorer" than the contented *thēs*. Here, in all essentials, is a subjective conception of economic value. Democritus and others will elaborate but scarcely advance upon it.⁹² At the very dawn of political thought, Solon is driven to it, so as to fill as best he can the vacuum left in his sense of order by the apparent lack of intelligible order in the acquisitive society.

B. Unequal Moira

Economic justice became a political issue with the demand for a "re-division of the land" (*Ath. pol.* 12. 3; Plut. *Solon* 13. 3). Behind the slogan "equal shares" (*isomoiria*) pressed the imperious need of the peasants, particularly those who held marginal land on the eroded hillsides.⁹³ The impossibility of scratching out a living from their wretched holdings had driven them to borrow before. It would drive them to borrow again, this time on the security of their land. With no better prospect of repaying the debt,⁹⁴ they [78] would now lose their land, as they had formerly lost their freedom. Hence the demand to augment their holdings at the expense of the larger estates. The claim was based on "equity" (*to ison*); equality to allotment must have been an old, deep-rooted tradition, for we see it cropping up later in strange places.⁹⁵ Thus Isocrates, whom no one could charge with equalitarian prejudices, declares flatly in a tirade against Sparta that "by right every man should have had [*sc.* in Sparta] an equal share of the land" (*Panath.* 179).

The importance of the issue is clear both from Solon's own words and from what we know of history. He had given the commons, in his political reforms, "more than they would have dreamed of" (Frag. 37. 2); yet they turned against him, "looked at him askance as an enemy" (Frag. 34. 5), when he refused them land. The pressure was so great that anyone else in his place, he

declares, would not have succeeded in "holding the people down."⁹⁶ Judged by his own "judgment of time" (*dikē chronou* [Frag. 36. 3]), Solon's work ended in failure. The people would not be held down. *Stasis* continued long after he had left office and finally led to the "foul bondage" of tyranny. By an irony of history, it was Peisistratus the tyrant, not Solon the liberator, who solved the agrarian problem of Attica, giving the people, if not what they asked for, at least enough to transform them into a reasonably prosperous and therefore "tranquil" part of the state.⁹⁷

What we have already seen of Solon's views would nevertheless explain the logic that prompted his decision. The peasants' claim to freedom falls under the rational justice of the *polis*; it can be recognized as a matter of common concern and be protected with the pooled resources of the state. But the claim for a redistribution of land falls under the irrational (or superrational) justice of wealth and cannot be adjudicated by the state. In the fragments Solon goes actually further. He does not say merely that the state can have no good reason for changing the peasants' god-given *moira*. He says, in effect, that the state has a good reason for preventing such change, for this would produce "excess" (*koros*) and *hubris*⁹⁸—the very terms by which the injustice of the nobles was described in Fragment 4. Hence Solon's horror of *isomoiria* between "the mean and the good"—a demand which would strike him as axiomatically self-refuting, since it carried the implication "equal *moira* between those of unequal *moira*." "Equal laws" and "straight justice" must be "adjusted" to these inequalities.⁹⁹ Thus property is the absolute precondition of political justice. It fixes inequalities of "privilege" and "honor" which must be respected and preserved as a matter of political justice: "The the *dēmos* [79] I gave such privilege [*geras*] as suffices;¹⁰⁰ I have neither added nor taken away from their honor [*timē* (Frag. 5)]."

⁹² Democ. Frags. 283 and 285; cf. Xenoph. *Hiero* 4.8

⁹³ The *hyperakrioi* of Hdt. 1. 59, the *diakrioi* of *Ath. pol.* 13. 4 and Plut. *Solon* 14. 1 and 29. 1. The problem would be further complicated by the existence of some who would be altogether landless. J. L. Myres (*Mélanges Glotz*, II, 666) seems to assume that all the *diakrioi* would be "outside the hereditary *klēroi* of the Plain" and thus unprotected by the old rule against the alienation of the *klēros*. This goes much too far and is, in any case, unverifiable: we have no means of knowing how soon after coming under cultivation new land would assume the status of *klēros*. However, I see no reason why the Woodhouse-Lewis interpretation (above, nn. 3 and 57) should exclude the possibility that the outermost patches had not become *klēroi* in time to prevent expropriation by the nobles; their former possessors would then find themselves after the *Seisachtheia* without a legal title to their land, and the demand for the "re-division of the land" would include their own need of resettlement.

⁹⁴ The tradition that Solon reduced the interest rates (Plut. *Solon* 15. 4) is untrustworthy (see Gillard [above, n. 3] pp. 192–94).

⁹⁵ Plut. *Solon* 14. 2. Theognis could say: "order has perished, equal distribution for all is no more" (lines 677–68). Needless to say, *isos* here, as so often later in reactionary social thought, is suffering semantic violence.

⁹⁶ (ὅς) ἂν κατέσχε τὸν δῆμον (Frag. 36.22 and again in 37. 7). Cf. also *epausato* (*sc. ton dēmon*) in Frag. 37. 7. Both words, *katechō* and *pauō*, are charged with moral connotations (cf. *katechein koron* in Frag. 4. 9 and the thrice repeated *pauet* in Frag. 4. 35–39).

⁹⁷ *Ath. pol.* 16. 7. It seems reasonable to assume that, in addition to the measures enumerated in *Ath. pol.* 16, some of the estates of the Eupatrid opposition were divided up among Peisistratus' "hill-men" (so Adcock in *CAH* 4, 65–66, and others).

⁹⁸ Frag. 6. 3–4. Solon adds, ἀνθρώποισιν δοῖς μὴ νόος ἀρετός ῥ'. But this moralistic flourish does not qualify the class determination of "sufficiency." Solon does not offer to give more land to any of the *dēmos* who, by moral standards, do have a "wholesome mind."

⁹⁹ Frag. 36. 18–19: εἰς ἕκαστον ἀρμοσας δίκην, "awarded to each his due" (*LSJ*, s.v. ἄρμωσας, I, b). Linforth's comments *ad loc.* are significant, though his interpretation of *harmosas* (the "adaptability of the new constitution to its multifarious purposes") is much too general for the context. *harmosas* in line 19 refers to *kakōi te k'agathōi* in the preceding line. The "adjustment" to the unequal privilege of the different social classes is on all fours with Solonian timocracy.

¹⁰⁰ "Sufficiency" clearly implies a measure. Cf. Eurip. *Suppl.* 555: τὰ γ' ἀρκοῦνθ' ἱκανὰ τοῖς γέ σάφροσιν; the context relates *ta arkounta* negatively to *pleonexia*, and positively to *dikē* (line 548) and *metra* (lines 539ff.).

In this, as in his whole concept of wealth, Solon is a traditionalist. His precedents are Homer and Hesiod, where "privilege," "honor," and "wealth" are assigned in unequal portions by *moira*; ¹⁰¹ this dispensation is neither open to question nor capable of justification; it is thus prior to political justice and the ground of all its claims. So Poseidon's grievance that he has suffered "violence" at the hands of Zeus turns on whether or not he is Zeus's "equal" (*Il.* xv. 167). Iris says that he is not; Poseidon insists that he is, countering Zeus's superiority in force (*biēi pherteros* [line 165]) and priority in birth (*geneēi proteros* [line 166]), with the fact that his own "lot" or "domain" ¹⁰² is comparable to that of Zeus: He is Zeus's equal in "portion" (*isomoros* [line 209]) and must be treated as his "equal in honor" (*homotimos* [line 186]). Man or god, everyone has his place in the order of "honor" established by *moira*; and the essence of justice is to deal with others in accordance with their place in this order, not to covet their "honor" or encroach upon it. ¹⁰³ This is how Solon thinks of the "noble" and the "mean." ¹⁰⁴ Each class has its own share of "privilege" and "honor" which only "excess" and "*hubris*" would disturb. "Noble" and "mean" are the old aristocratic categories. Solon preserves them with a single innovation: he cancels aristocratic birth from the prerequisites of status. *Moira* can now be simply equated with property: "to each class he awarded political office in proportion to their rateable property" (*Ath. pol.* 7. 3).

Solon's fragments do not allude directly or indirectly to this change from aristocracy to timocracy. The four income classes are not mentioned. Only two classes are in evidence, reminding us of nothing so much as of Anaximander's opposites, ¹⁰⁵ [80] encroaching upon each other and then compelled

¹⁰¹ Sometimes *moira* is personalized as the will of Zeus, e.g., Hesiod *Th.* 73–74 (cf. *ibid.* 885 ἐὺς διεδώσατο τιμὰς; and *Aesch. Suppl.* 360, Διὸς κλαρίων; and *PV* 229: δαίμοσιν νέμει γέρας ἄλλοισιν ἄλλα). There is a deep-lying connection here between *moira* and the land lot which is the primitive basis of wealth. See F. M. Cornford, *From Religion to Philosophy* (London, 1912), pp. 15–21; and cf. Wilamowitz, *Der Glaube der Hellenen* 1, 360n 1: 'μορος ἀν κτήρας, Landparzelle, was auch bei Hesych neben anderen Erklärungen steht, ist lebendig in Lokris, *SPAW* 1927, 15 und Lesbos *IG XII* 2, 74." However, *moira* is broader than landownership. It includes other ways of making one's living, e.g., *technē*. So, e.g., *Hdt.* 2. 53 τοιοῦτοι θεοῖσι . . . τιμὰς τε καὶ τέχνας διελόντες. (Cf. *Aesch. PV* 48, where Hephaestus thinks of his *technē* as *moira* [*sachein*]). This throws further light on the association of the *technai* with wealth in relation to *moira* in Solon's *Frag.* 13.

¹⁰² *Moira* in line 195 means both. The notion of the lot is underlined through the three repeated *lanchanō* (lines 190–92).

¹⁰³ Cf. *Od.* 13. 141–45 Zeus to Poseidon: οὐ τι σ' ἀτιμάζουσι θεοί, for "the gods are not unjust to you." The context brings out clearly the interconnection of *timē*, *biē*, and *tisis*. It is "violence" which refuses to "pay" due "honor" and must therefore be compelled to "pay." Compare also the terms in which Prometheus' sin is presented in Aeschylus: he has "robbed" the "honors" and "privileges" of the gods and has thus gone "beyond justice" (*PV* 30 and 38).

¹⁰⁴ *Frag.* 34. 9 and 36. 18.

¹⁰⁵ With one striking difference. Anaximander's opposites are equal. I am justifying this interpretation elsewhere. Meanwhile, suffice it to recall that the "equality" of the basic components of

to render "justice and reparation to one another according to the ordering of time." ¹⁰⁶ First, the rich were guilty of "*hubris*," "excess," and "robbery" (*Frag.* 4. 8–13). Justice exacted reparation, the ward-stones which they had planted over the *dēmos'* land were pulled up, and the old—"just"—dispensation of land was restored. Then came the turn of the *dēmos* to seek encroachment upon the rich; if unrestrained, they, too, would have committed "*hubris*," "excess," and "robbery." ¹⁰⁷ Solon's place is in the middle ground between these aggressive extremes to keep them from overstepping the line which *moira* has fixed between them:

I stood betwixt them as a boundary-mark [*horos*] in the middle-ground between two armies [*en metaichmōi*]. [*Frag.* 37]

Like a wolf at bay amidst a pack of hounds, I turned,
Defending myself against attacks from every side. [*Frag.* 36, text and translation following Linforth]

Holding a mighty shield over both groups, I stood,
To neither would I grant unjust supremacy. [*Frag.* 5]

In all this Solon speaks in the first person singular. Yet clearly he was not alone in the "middle ground." ¹⁰⁸ Between Eupatrids and hektemors was the trading class, whose chief article of export, the amphora, Solon stamped on

man and the cosmos is a broad feature of early Greek scientific thought; e.g., Alcmaeon *Frag.* 4; Empedocles *Frag.* 17, Parmenides *Frag.* 9: φάος καὶ νυκτός . . . ἴσων ἀμφοτέρων, with which compare Alexander Polyhistor on Pythagorean doctrine in *Diog. Laert.* 8. 26: ἰσόμερά τ' εἶναι ἐν τῇ κόσμῳ φῶς καὶ σκότος, etc. In the Hippocratic treatises this *isomoria* of components is the heart of the doctrine of *krasis*, e.g., *Nature of Man* 3. 7–14 (Loeb *Hippocrates*, Vol. 4 [Jones]), where καλῶς ἔχειν τῆς κρήσιος πρὸς ἄλληλα is equivalent to μετρίως πρὸς ἄλληλα ἔχειν καὶ ἴσως; and *On Airs* 12. 14–99 (Loeb *Hippocrates*, Vol. 1 [Jones]), where *krēsis tōn hōrōn* exists wherever παντὸς *isomoiriē dunasteuei*. Empedocles' words, τιμῆς δ' ἄλλης ὦλο μέδει (*Frag.* 17. 28), have been misunderstood as a negation of *isotimia* (R. Hirzel).

Themis, "Dike" and *Vervantes* [Leipzig, 1907], p. 314n.6). But they should be read in the light of the following line, ἐν δὲ μέρει κρατέουσι περιπλομένοι χρόνοι. We know that *en merei kruteein* is a typical democratic assumption (Eurip. *Suppl.* 406: δῆμος δ' ἀνάσσει διαδοχίῳ ἐν μέρει ἐναυσίῳ, and Bonitz, *Index Aristotelicus* 455b13–23, *kata meros* and *en merei archein*). For the same assumption of successive supremacy between equal opposites, see *Nature of Man* 7. 49–52: ὑπὸ δὲ τῆς περισταμένης ὥρης ποτὲ μὲν πλεῖον γίνεται αὐτὰ ἐσωτέρων (sc. the humors in the body) ποτὲ δὲ ἐλάσσον, ἕκαστα κατὰ μέρος καὶ κατὰ φύσιν.

¹⁰⁶ Cf. *τὸν χρόνον τάξιν* in Anaximander with Solon's *dikei chronon* (*Frag.* 36. 3) and τὸ πάντως ἥλθ' ἀποτεταμένη (*Frag.* 4. 16).

¹⁰⁷ *Frag.* 6. 3 and 34. 1.

¹⁰⁸ Cf. *Plut. Solon* 14. 3, and the Delphic oracle (*ibid.* 14. 4), promising that "many in Athens will be your allies." Ἦσο μέσσην κατὰ νῆα in this oracle underlines the "middle" position at the expense of an awkward metaphor: the middle of the ship was no place for steering (*Aesch. Suppl.* 717: οἶακος εὐθύντηρος ὑστάτου νεώς and *Theb.* 2. 6: ἐν περιμένη πόλεως οἶακα νομῶν). For Solon himself as a man of the "middle," see *Ath. pol.* 4.3; *Plut. Solon* 1. 2, as merchant, *Ath. pol.* 11. 1, *Plut. Solon* 2. 1. Plutarch's description of the men of the Shore (*Plut. solon* 13.1) fits precisely the role that Solon adopted between the two extremes (cf. also *Ath. pol.* 13. 4).

the new coinage of the public mint.¹⁰⁹ This class would be dead set against any "re-division of land," yet equally opposed to the old aristocratic order. One can imagine its impatience with the Eupatrids' endless feuds,¹¹⁰ their preoccupation with the advancement of their own house at the expense of the public,¹¹¹ their proved incapacity to pursue the far-sighted, aggressive foreign policy required by the interests of trade. The merchants needed the conquest of Salamis, the reform of the coinage, the reform of the system of weights and measures, the influx of skilled workers from abroad. Implemented by Solon, these policies gave Athens a running start in its race for foreign markets against its powerful rivals, Aegina and Megara.¹¹² Not only these specific measures but the whole of Solon's polity, with its peculiar blend of radicalism and conservatism, answers admirably the needs of this "middle" class: the judicial and political reforms broke the Eupatrid stranglehold on state power; yet the timocratic "adjustment" of office to property [81] would keep the new executive free from the rural masses.

It would be an oversimplification to think of Solon planning his policies in the interests of the merchants alone. In the case of Salamis, his appeal was intensely patriotic: the honor of the "fatherland" was at stake; all Athenians were "intolerably dishonored" by the loss of it (Frgs. 1–3). He achieved the reconquest of the island in the face of sternly repressive measures from the Eupatrid authorities by mobilizing wide popular support (Plut. *Solon* 8. 2). Later, the manifesto of his reform program opened with the words "Our city" and charged the nobles with threatening to destroy it.¹¹³ It won the support of the *dēmos* by merging the cause of their personal freedom with the common freedom of the *polis*.¹¹⁴ But it did not say that *dēmos* and *polis* are one. Solon's fragments never use "*dēmos*," as Callinus had used it in Ionia, to mean the whole community, the "little" man as well as the "big."¹¹⁵ For Solon

¹⁰⁹ C. T. Seltman, *Athens. Its History and Coinage* (Cambridge, 1924), chap. 3. To be sure, this was not a Solonian innovation: the oil amphora appears also on Athenian coins of the Pheidonian standard. But it is significant that Solon had scarcely left Athens before Eupatrid badges displaced the amphora.

¹¹⁰ Plutarch says that Salamis and Nisaea were lost during the Cylonian feud (*Solon* 12.3).

¹¹¹ Solon accuses them of stealing temple funds and public funds (Frag. 4. 12–13).

¹¹² Witness the leap in the export of pottery in the first two decades of the sixth century (B. L. Bailey, "The Export of Attic Black-figured Ware," *JHS* 60 [1940], 62–64). Cf. Seltman's interpretation of the reforms of weights, measures, and coinage: "a far-sighted reform that would open the way to world-markets and to prosperity for Athens" (*Athens*, p. 16).

¹¹³ Frag. 4. 5: φθείρειν μεγάλην πόλιν βούλονται.

¹¹⁴ See above, Part I, Sec. C.

¹¹⁵ Frag. 1, where *dēmōi* in line 16, *oligos kai megas* in line 17, and *taūi sumpanti* in line 18, are parallel expressions. However, the adjective *dēmosion* in Solon (Frag. 4. 12 and 27) shows how difficult it was for any Greek to keep *demos* and *polis* apart. As has often been remarked, in Homer *dēmos* means not only "land" but also "people" (e.g., *Il.* 3. 50: πόλῃ τε παντὶ τε δήμῳ), cf. *ibid.* 17. 250: *dēmia pinousa* and 9. 64: *polemos epidēmos*. The aristocratic tradition sublimates "*dēmos*" to describe its own "peers," e.g., the Spartan rhetra in Plut. *Lyc.* 6, and Tyrtæus *Frags.* 9. 15 (Diehl).

the *dēmos* remains a fraction of the *polis*, and a troublesome one, no more content with its *moira* than the nobles had been content with theirs. Only those who could be counted on to oppose both these turbulent extremes and to make common cause with either in order to hold the other in check could be said to stand for the good of the *polis* as a whole. That is why, perhaps, Solon never mentions or alludes to the men of the "middle" as a distinct class, alongside of the nobles and the commons. Their interests merged with the interests of the Solonian *polis*.

III. CONCLUSION

The main result of this study has been to untangle two strands in Solonian justice and connect each with its counterpart in Solonian policy. One is the rational *dikē* of the *polis*; this is the dynamic principle of Solon's reconstruction of Athenian institutions. The other is the superrational *moira*¹¹⁶ of private wealth, this is the restraining principle in Solon's conservatism. Thus Solon's *eunomiē* is the resultant of two opposing tendencies. One of them, most clearly seen by Freeman, is the "negative principle of universal moderation," whose maxim is "let none encroach" and whose purpose is not reform but restraint.¹¹⁷ From this point of view, the Solonian *polis* looks like a formidable array of balanced negations, checks, and counterchecks, everyone on his guard against encroachment by anyone else. But there is a mainspring which keeps this system in motion, and this is the initiative of every member of "our" *polis* in the interest of the common well-being. Here is a positive, creative principle, even when conceived under the aspect of *hēsuchiē*: for this is the law not of mechanical stability but of organic health; it is not a curb upon growth and development, but the reverse. *Eunomiē* could—and did—sponsor far-reaching change, subject only to two conditions: that the motive be the [82] common peace and the common freedom and that the existing *moira* of property be not disturbed.

In the crucial instance of the *Seisachtheia*, there was no redistribution of land. The ward-stones were pulled up from land which had belonged to the peasant and still did, however incumbered. Indeed, the *Seisachtheia* said nothing about land; it only canceled debts on the security of the person. And it did so because the common freedom of the *polis* was here at stake. Thus the

¹¹⁶ Solon's diction does not observe a hard-and-fast distinction of *moira* as "fate" and *dike* as "justice." So much is clear from Frag. 13. Yet this same fragment also shows that Solon is more likely to use *dikē* when he thinks of destiny as an intelligible principle of moral reparation, as he does in the opening lines; then, under the growing sense of the inscrutability of destiny and the insecurity of man's endeavor, he shifts to *moira* (lines 30ff.).

¹¹⁷ Pp. 83–84 and 201–3. Freeman (*The Life and Work of Solon*) concludes that there is nothing more in Solonian justice than this negative ideal: no "creative idea, not even a political bias" (p. 83).

most important of Solon's social and economic reforms was prompted by his concept of political justice. Therein lies his greatness: that, despite the traditionalism of his concept of wealth, he was able to envisage this revolutionary conception of justice based on the solidarity of the *polis*.

The nobles had claimed the giving of justice as their exclusive prerogative.¹¹⁸ So long as justice remained shrouded in mystery and magic, their claim was incontrovertible; for they were themselves the accredited representatives of the oracles. They "had knowledge of divine things . . . and were interpreters [*exēgētai*] of things sacred and holy."¹¹⁹ Solon raised no questions about their *expertise* in the supernatural. He conceded their authority in the unwritten law of ceremonial sanctities and its great annex in the written law, homicide. But he then cleared a wide area in which justice was "the immanent righteousness of events,"¹²⁰ and as such a matter of "common" or "public" truth. This could never be claimed as the guild secret of a closed corporation. It was open to all men of understanding who could follow the sequence of events and "teach" it to others. Thus the naturalization of justice meant its socialization: it became the common possession of the *polis*, for it defined the common peace and the common freedom of all.

¹¹⁸ Cf. Eurip. *Suppl.* 430.

ὅπου τὸ μὲν πρῶτιστον οὐκ εἰσὶν νόμοι
κοινοί, κρατεῖ δ' εἰς τὸν νόμον κεκτημένος
αὐτὸς παρ' αὐτῷ.

substituting *eupatridai* for the "one" (*sc.* "tyrant") in this passage. Incidentally, the immediately following lines here (443–47) bring out another point which I have kept out of the text to simplify the argument: written law had been the first inroad into the nobility's monopoly of justice: it was the first bridgehead of "community" or "publicity" of law. But it did leave the nobility a residual area of "privacy" both (*a*) in their interpretation of the written law and (*b*) in the unwritten law.

¹¹⁹ Plut. *Theseus* 25.2

¹²⁰ Jäger's phrase "Die immanente Gerechtigkeit des Geschchens," in "Solons Économie" above, n. 3, p. 79

EQUALITY AND JUSTICE IN EARLY GREEK COSMOLOGIES

THE EARLY GREEK notion of justice lends itself with seductive ease to application far beyond the bounds of politics and morals.¹ To respect the nature of anyone or anything is to be "just" to them. To impair or destroy that nature is "violence" or "injustice." Thus, in a well-known instance, Solon speaks of the sea as "justest" when, being itself undisturbed by the winds, it does not disturb anyone or anything.² The law of the measure is scarcely more than a refinement of this idea of one's own nature and of the nature of others as restraining limits which must not be overstepped.

Cosmic justice³ is a conception of nature at large as a harmonious association, whose members observe, or are compelled to observe, the law of the measure. There may be death, destruction, strife, even encroachment (as in Anaximander). There is justice nonetheless, if encroachment is invariably repaired and things are reinstated within their proper limit. This is the vantage-point from which the commentators have generally interpreted cosmic justice in the pre-Socratics. It is perfectly sound. But it leaves out the additional postulate of equality; for, clearly, it is quite possible to think of harmony and nonencroachment as a relation between unequals. Solon so thought of it.⁴ But

From CP 42 (1947): 156–78. Reprinted in Furley and Allen I, pp. 56–91. Used by permission. Minor changes have been made to punctuation and spelling and some Greek titles of works have been translated.

¹ [I am indebted to Professor Hermann Fränkel and Mr. F. H. Sandbach for helpful criticisms of an earlier draft.] [I regret that other obligations have prevented me from making the revisions and expansions of the argument of this paper that would be needed to make full use of valuable publications which have appeared since it was published. However, I have gone through the paper and have pruned away from its original text things which I now consider false or seriously misleading. In the section on Parmenides, this resulted in drastic cuts and in some rewriting. Elsewhere it has involved some deletions (chiefly in the notes) and a few changes, chiefly verbal, in the text. For some later remarks on *isonomia* in Anaximander and Alcmaeon, I may refer the reader to my "Isonomia," *AJP* 74 (1953), 337–66 at 361–36 (**1 107–11) }

Frag. 11 (Diehl). For the interpretation see my "Solonian Justice," *CP* 41 (1946), 66, n. 18 I 34n 18)

² [The expression is redundant in Greek, since *kosmos* itself means a "just" order, e.g., Solon I 11 (Diehl) and Theognis 677.]

⁴ See my "Solonian Justice," pp. 78ff. (**1.50ff.)

the founders of Greek scientific thought generally⁵ made the opposite assumption: they envisaged harmony in terms of equality. Cosmic equality was conceived as the *guaranty* of cosmic justice: the order of nature is maintained *because* it is an order of equals. To my knowledge, this has never been established.⁶ I propose to review the relevant evidence and interpret briefly its historical significance.

I. MEDICAL THEORY

Greek medical thought offers two well-known formulas of equalitarian harmony: Alcmaeon's definition of health as "equality (*isonomia*) of the powers"⁷ and the conception of temperate climate (*krēsis tōn hōreōn*) in *On Airs, Waters, Places* 12, as equality (*isomoiria*) of the hot and the cold, the dry and the moist.⁸ *Isonomia* and *isomoiria* here render explicit the equalitarian assumption implicit in the first principles of medical theory, *dunamis* and [156] *krasis*. The original meaning of *dunamis*, as Peck observes, is not "a substance that has power" but rather "a substance which is a power, which can assert itself, and by the simple act of asserting itself, by being too strong, stronger than the others, can cause trouble."⁹ Its strength must, therefore, be "taken away"¹⁰ and thus "moderated."¹¹ And this is to be done not through repression by a superior but through counterpoise against an equal. This is the

⁵ With the qualification which we shall notice in the case of Heraclitus.

⁶ But see the interesting material on "equality in nature" collected by R. Hirzel, *Themis* (Leipzig, 1907), pp. 308–11; and Werner Jaeger, *Paideia*, I, 104 (my references to this book here and throughout are to the English translation [2nd ed., New York, 1945]).

⁷ Alcmaeon Frag. B4. (All references to pre-Socratic fragments are to DK.) *Isonomia* means more than "equality under the law"; it means, rather, "equality of rights" and thus implies equality of dignity or status among the citizens (see, e.g., Hdt. 3. 142. 3; Thuc. 6. 38 3). *Oligarchia isonomos* (Thuc. 3. 62 3), possible as a form of speech, does not invalidate the traditional association of *isonomia* with democracy (I have discussed the point at length in "*Isonomia politikē*" in *Isonomia. Studien zur Gleichheitsvorstellung im griechischen Denken*, J. Mau and E. G. Schmidt (eds.), Berlin, 1964 (repr. in my *Platonic Studies* [Princeton 1973], pp. 164ff.).

⁸ These two pairs head the list of opposites in Aëtius' report of Alcmaeon's doctrine (*loc. cit.*). As for *isomoiria*, it means "equality in portion," as, e.g., of heirs inheriting equal shares of an estate (Demosth. 48. 19; Isaeus 1. 2 and 35) and, therefore, "equality in personal and social status or dignity," e.g., Il. 15. 186–95, 209; Poseidon is Zeus's *homotimos* because he is his *isomorphos*.

⁹ In his Intro. to Aristotle's *Generation of Animals* (Loeb Classical Library [1943], p. li). For a good example, see the definition of pathogenic *dunamis* in *On Ancient Medicine* 22. 3–4 (Hippocrates, ed. W. H. S. Jones, Vol. I [Loeb Classical Library]) as the "intensity and strength of the humors." For "strength" (*ischus, ischuron*), see *ibid.*, chap. 14; for "strong foods," *ibid.* chaps. 3–6; see also below, n. 19; and cf. *Timaeus* 33a: "hot things and cold and all things that have strong powers . . ."

¹⁰ *On Ancient Medicine* 16. 48. *aphatreomenon tēn dunamin*.

¹¹ *Metriās, metriotēs*, common through the Hippocratic writings. *Isōs* is sometimes added for emphasis (*On the Nature of Man* 3. 7–8 [Jones, *Hippocrates* [Loeb Classical Library] vol. 4]).

heart of the doctrine of *krasis*. Alcmaeon's *isonomia* of the powers is no more than its earliest-known statement at a time when interest still centered in the fact of equilibrium itself rather than in the specific nature of the equilibrated powers.

The kind of equality here envisaged can best be gauged from the methodology of "Hippocratic" medicine. Observation, for all its acuteness, is mainly directed toward qualitative data, with only the vaguest quantitative base.¹² No effort is made to measure individual "powers," generalize their observed values, and construct therefrom an equation, however crude. The existence of the equation is rather an outright assumption. If there is health, it is assumed that the constituent powers must be (1) in equilibrium and therefore (2) equal to one another, much as opposing parties in an evenly matched contest are assumed to be equal.¹³ This is exactly the sense in which equality figures in the medical treatises and, indeed, as we shall see, in the whole development of early cosmological theory from Anaximander to Empedocles. Powers are equal if they can hold one another in check¹⁴ so that none can gain "mastery" or "supremacy"¹⁵ or, in Alcmaeon's term, "monarchy" over the others. Medical theory assumes this kind of equality even when it conceives *krasis* not as the equipoise of pairs of physical opposites (hot-cold, dry-moist, etc.) but as a many-valued blend of powers;¹⁶ for here, too, the purpose of blending is to ensure that "no individual power is displayed."¹⁷ Should any power escape this blending and "stand by itself,"¹⁸ it would be ominously "strong" and thus create the "monarchy" which constitutes disease.¹⁹

¹² The best clue to the observational roots of the doctrine of *krasis* (and its offspring, the doctrine of the humors) is the mention of "unmixed" substances in stools (*diachōrēmata akrēta*, *aplepta* often in *Epidemics* 1 and 3) and in vomit, sputum, and urine (e.g., *Prognosis* 12–14). The humors were, no doubt, postulated to account for these unmixed substances: cf. the frequent association of "bilious" with "unmixed" in *Epid.* 1 and 3, and conversely, *Progn.* 13. "the vomit is most useful when phlegm and bile are most thoroughly mixed together."

¹³ [Cf. the meaning of *isopaleēs* and Hdt. 1. 82. 4, and of *isorropos* and Eurip. *Suppl.* 706.]

¹⁴ Cf. Ps.-Arist. *De Mundo* 396b35, where *isomoiria* is paralleled by the expression "no one of them is more powerful [*pleon dunasthai*] than any other"; and this is, in turn, explained by adding "for the heavy is equally balanced [*isēn antistasin echel*] with the light, and the hot with the cold" (Forster's translation).

¹⁵ Cf. *On Airs, Waters, Places* 12. 18: "nothing has violent supremacy" (*mēden ēi epikrateon huiōs*), as a parallel expression to "*isomoiria* prevails."

¹⁶ As, e.g., in the doctrine of coction in *Ancient Medicine* which assumes "innumerable" powers (*kai alla muria* [14. 33–34, 17. 9–10]) and lays down the principle that these "become milder and better the greater the number [sc. of powers] with which they are mixed" (19. 53).

¹⁷ *Ibid.* 19. 55–6.

¹⁸ *Ibid.* 14. 37. 38. *auto eph' heōtoutou genetai*. Cf. *Nature of Man* 10–11: *eph' heōtoutou stēi*. Cf. below, n. 167.

¹⁹ *Pathōn* 16 (Littre, 6. 224): "for phlegm and bile, when concentrated [*xunestēkota*], are strong and dominate in whatever part of the body they establish themselves and cause much trouble and pain."

When we come to the "*krasis* of the seasons," we move directly into the area of cosmic justice; for medical thought is not [157] content with the empirical fact that some climates are better suited than others (and thus more "just") to human nature. It goes further to explain the harmony of human nature to its environment through an absolute cosmic fact, i.e., the harmony of the environmental forces with one another.²⁰ This is, in turn, construed as an equilibrium of opposites. But there is a difference. This *isomoiria*, unlike that of the body, can be grounded in an observable equation which is capable of strict quantitative expression—the equinox, when (1) day is equal to night,²¹ (2) all the hours throughout the day and night are equal to one another,²² and (3) the sun rises at a point midway between the northernmost and the southernmost risings of the year (i.e., the summer and winter solstices). That climatic *isomoiria* should be attended by these astronomical equalities was so impressive that the relation between the two was taken as one of causal implication. Thus the Island of Iambulus in Diodorus ii. 56. 7 is endowed with a year-round equinox to validate its claim to the most temperate of climates.²³

But if *isomoiria* belongs to the equinoctial seasons, a way must be found somehow to bring the rest of the year within the framework of equalitarian harmony. This was done through the idea of rotation in office, or "successive supremacy" (*en merēi* or *kata meros kratin*), among the powers. As in the democratic *polis* "the demos rules by turn,"²⁴ so the hot could prevail in the summer without injustice to the cold, if the latter had its turn in the winter. And if a similar and concurrent cycle of successive supremacy could be assumed to hold among the powers in the human body, then the *krasis* of man and nature would be perfect. Medical thought must have moved gradually toward this elegant tissue of assumptions.²⁵ In *Epidemics* i and iii, we see the view that each season has its own "constitution," which aggravates some diseases and relieves others.²⁶ On *Airs, Waters, Places* goes into physiological details on the dependence of the healthy body on an ordered sequence of seasonal change, explaining how even [unseasonably] good weather {, if unseasonable,} would be harmful (chap. 10). Finally, that confident dogmatist, the author of *On the Nature of Man*, produces the full-blown theory:

²⁰ E.g., the physician Eryximachus in Plato's *Symp.* 188a, cf. also *Laws* 10. 906c.

²¹ [And thus light is in *isomoiria* with darkness; cf. the report of Pythagorean doctrine by Alexander Polyhistor, *apud* Diog. Laert. 8. 26.]

²² These are the standard hours of scientific inquiry, the "equinoctial hours," as over against the variable seasonal hours" (*hōrai kairikai*) in popular usage (see Th. H. Martin, "Astronomia" in Daremberg-Saglio, p. 485a).

²³ [Ps. -] Aristotle *Probl.* 942b37, ἡ ἱσημερία ἐστὶ χειμῶν τε καὶ θέρος ἰσοκρατής.]

²⁴ Eurip. *Suppl.* 406

²⁵ Their earliest foundation was the commonsense business of adapting food, clothing, etc., to the prevailing weather: e.g., cold potions in the summer, hot in the winter (*Regimen in Acute Diseases* 19 [Jones, *Hippocrates*, Vol. 2]; cf. Heraclides of Tarentum *apud* Athen. 2. 45d)

²⁶ The *locus classicus* is *Epid.* 3. 15

Man's body has always all of these [*sc.* four humors]; but as the seasons revolve they [*sc.* the humors] become now greater, now lesser, each in turn [*kata meros*] and in accordance with nature. . . . At one time of the year winter is strongest; next spring; then summer; then autumn. So too in man at one time phlegm is strongest; next blood; next bile, first yellow, then the so-called black. [7. 48–52 and 61–66]

II. EMPEDOCLES

Empedocles is our best bridge from medicine to philosophy proper. His thought was so congenial to the medical theorists of his time that, by all accounts, his influence upon them was enormous.²⁶ [158] Even in the Aegean it was strong enough to draw the fire of the author of *Ancient Medicine*.²⁷ In his system man's flesh and blood is made up of the four world-components on the pattern of *isomoiria*; where this equality is imperfect, we get the deviations from perfect health and wisdom in man.²⁸ But in the cosmos the "roots" are strictly equal among themselves;²⁹ and, since each of them is, like Parmenides' Being, eternally equal to itself,³⁰ cosmic justice is perpetually sure. Even at the zenith of the ascendancy of Strife,³¹ when each of the four "roots" would be "unmixed" (Frag. B35.15) and thus, by Hippocratic norms, a "strong substance," no harm could result, for none would be stronger than any of the rest. Thus, even when Strife rules the World, equality is a sufficient preventive of "injustice."

Much has been written on what Empedocles really meant by the "equality"

²⁶ Wellmann (*Fragmente der sikelischen Ärzte* [Berlin, 1901], pp. 68ff.) spoke of him as the "founder" of the Sicilian school, and his statement has often been repeated. Neither Gulen nor any other ancient authority goes so far (see the texts under Emp. Frag. A3). However, it may well have been the influence of his four "roots" that fixed the first two pairs of opposites in Alcmaeon's list (Frag. B4) as the canonical *dunamis* in Sicilian medicine and even elsewhere (usually in combination with the doctrine of the humors as, e.g., in Diocles, Frag. 8 in Wellmann, *Peri pathōn* I [Littre, VI, 208], *Peri nousōn* i. 2 [Littre, 6, 142], *Peri top. k. anth.* 42 [Littre, 6, 334]).

²⁷ Jaeger (*Poetika*, Vol. 3, chap. 1, p. 40) rightly warns against taking Empedocles as the sole butt of the polemic. Certainly, the scope of the argument is much broader. But it is nonetheless significant that Empedocles is the only opponent to be named. He clearly represents the objectionable influence of "philosophy" in its most oppressive form.

²⁸ Emp. Frags. B98, A78, A86 (Theophr. *De sensu* 10–11).

²⁹ Emp. Frag. B17.27. Cornford (*From Religion to Philosophy* [London, 1912], p. 64) observed that Empedocles' roots are, like the three gods in *Il.* 15 "equal in status or lot." Actually, the equality of the roots is more thoroughgoing. In the *Iliad* it could be claimed for Zeus that he is superior in force and prior in birth (15.165f.). Neither could be claimed for any of the Empedoclean roots.

³⁰ Emp. Frag. B17.35. *ēnekes aien homōia*; and the thrice repeated *auta estin tauta* (Frgs. B17.34, B21.13, B26.3)

³¹ This ascendancy of Strife is never explicitly mentioned in the fragments. But it is a legitimate—indeed, unavoidable—inference from (1) the general principle of alternate dominance of Love and Strife and (2) the amply attested dominance of Love in the *Sphaeros*.

of his elements. In one argumentative passage (*De gen. et cor.* 333a19–34), Aristotle professes to be in the dark as to whether equality in volume³² or in “power”³³ was meant; in another (*Meteor.* 340a14) he gives himself away, assuming the latter (ἴσα τὴν δύναμιν εἶναι) as a matter of course.³⁴ Aristotle’s quandary in the first passage, even if only rhetorical, shows well enough that the distinction had not been settled by Empedocles. The second passage suggests just as well that “power” was, nevertheless, uppermost in Empedocles’ mind, as it certainly was for the medical writers.³⁵ Empedocles is not averse to spatial categories: Love is “equal in length and breadth.”³⁶ But when he formally declares that the roots are equal, he immediately goes on to say that (1) they are of equal age, (2) each has its peculiar honor (*timē*),³⁷ but (3) they rule in turn (Frag. B17.27–29).³⁸ Could we ask for more conclusive proof that not mere extension but “power” (with its associated concept of “honor”) is uppermost? Points 2 and 3 state the principle of “successive supremacy,” whose significance in [159] medical theory has just been explained (see above, p. 60); and they are introduced by Point 1, which rules out flatly the possibility that any of them could claim permanent supremacy in virtue of seniority rights.³⁹ Because of Point 1 the universe cannot be a “monarchy,” for no power within it possesses the qualifying primogeniture. Because of 2 and 3, the universe must be [an] (characterized by) *isonomia*, for it conforms to the democratic principle of rotation of office.

Thus Empedocles builds a universe to the specifications of Alcmaeon’s formula of health; and in so doing he levels ancient inequalities which had been fixed by religious tradition. Zeus, heretofore “king of kings, of all the blessed the most blessed, over all the mighty sovereign in might” (Aesch.

³² *Kata to poson* (line 20), purely metric dimension; in *Meteor.* 340a7–9, Aristotle speaks of *onkos*, *plēthos*, and *megethos*.

³³ *Hoson dunatai* (line 24). A third possibility, based on the distinction of *poion* and *poson* (lines 27ff.), need not detain us here. In Empedocles and his predecessors, *dunamis* antedated this distinction and denoted either quality or quantity or else (more commonly) both.

³⁴ Empedocles is not named here; but it is generally agreed that the reference is to him.

³⁵ See above, p. 59.

³⁶ Emp. Frag. B17.20. Tannery was mistaken in taking this spatial expression as “Empedocles’ true thought” and discounting the dynamic *atalanton* in the preceding line as “metaphorical” (*Pour l’histoire de la science hellène* [2nd ed., Paris, 1930], p. 314). [Parmenides had used a similarly spatial formula of Being (Frag. B8.49: *panthōthen ison*), whose primary property is, nonetheless, dynamic equilibrium (Frag. B8.44: *isopulēs pantēi*).]

³⁷ Cf. Emp., Frag. B30.2 *eis timas t’ anorouse* (sc. *Neikos*).

³⁸ With *en merēi kratousti* here (and also in Frag. B26.1) cf. Frag. B30.3 *amonbaios* (sc. *chronos*), [and Plato *Soph.* 242d].

³⁹ See Peisithetaerus’ argument in the *Birds* 471ff.: the birds are “prior to the earth and prior to the gods. . . . Being the eldest, the kingship is rightfully theirs.” This law is also the logic of Plato’s long-winded argument in *Laws* X, tersely anticipated in *Tim.* 34b–c.

Suppl. 524–26) is now merely one of the roots on a par with the “unheard-of”⁴⁰ divinity, Nestis, so inconsequential that its very identity remains in doubt. And as for Strife—“unseemly,” “dreadful,” “evil,” “mad”⁴¹—every impulse of sentimental justice would urge its subordination to the power that makes all “have thoughts of love and work the works of peace” (Frag. B17.23), “queen Cypriis,” who in the golden age ruled alone in place of Zeus (Frag. B128). But equalitarian justice rules otherwise. Were not Harmony matched with its perfect equal in Strife, there would be no created world, only the nondescript mixture of the *Sphairos*. It is only the strictly reciprocal power of Strife to undo the work of Harmony and “prevail in turn” (Frag. B17.29) that makes a cosmos possible.⁴² And, this equality once assured, the process works just as well backward as forward: whether Harmony or Strife has supremacy, the other will be “rising up to [claim] his prerogatives” (Frag. B30.2), and a world will be born and destroyed in either case.

A lacuna in the argument so far is the apparent absence of any explicit reference to justice in the fragments; the word *dikē* is never mentioned. My answer is that the reference to justice is nonetheless present; Empedocles’ surviving words, if carefully examined, contain expressions which are charged with the imagery and notion of justice. Consider Fragment B30 once again: Strife “rose up to [claim] his prerogatives in the fullness of alternate time set for them [sc. Love and Strife] by the mighty oath. . . .” (Burnet’s translation). The fragment breaks off abruptly. But we hear of “mighty oaths” again in Fragment B115, where they “seal” the “decree of the gods.” Here “oaths” represent the binding, inviolate, *necessary* character of that decree,⁴³ which is an “oracle of *Anankē*.” But we know that in Parmenides *Anankē* and *Dikē* perform the same function of holding Being fast “in the bonds of the limit.”⁴⁴ We may thus infer that “mighty oath” in Empedocles, like “strong *Anankē*” in Parmenides, alludes to the orderliness of existence conceived [160] under the aspect of justice. This inference is confirmed by three other terms in the fragment:

⁴⁰ Wilamowitz, *Glaube der Hellenen*, 1 (Berlin, 1931), 20.

Emp. Frags. B27a, B17.19, B20.4, B115.15. Aristotle (*Metaph.* 1075b6–7) is shocked at the thought that Strife, the principle of evil (*hē tou kakou phusis*), should be imperishable in Empedocles.

⁴² The mutual interdependence between opposites is explicit in *Nature of Man* 7.56–59: “if one [i.e. of the hot, cold, dry, moist] were to fail, all would disappear, for by the same necessity all are constituted and are nourished by another” (translation adapted from Jones (above, n. 11)).

⁴³ The oath was often thought so important an aspect of justice that *horkion* could be taken as equivalent to *dikaion* (Diog. Laert. 8.33). Cf. *theōn enorkon dikan* in Soph. *Ant.* 369.

⁴⁴ Parm. Frag. B8.14–15 and 30–31. Frankel observes of *Anankē* in Frag. B8.30: “Ihr Tun wird dadurch begründet, daß das Gegenteil nicht *themis* sein würde” (“Parmenidesstudien,” *Göttinger Nachrichten* [1930], pp. 153–92, at p. 189. My heavy debt to this study will be evident throughout this paper).

1. "THE 'PREROGATIVES' (*timai*) OF STRIFE."⁴⁵ This tells us that the dominance of Strife is not lawless self-assertion but duly established right or "office";⁴⁶ it is its "rightful share" or "just portion" (*aisa*).⁴⁷

2. "IN THE FULLNESS OF TIME" (*teleiomenoio chronoio*). "Time" here is no abstract measurement of the passage of events. It is the proper time-span allotted to Strife (as also to Love) in the cosmic order; it is a "measure" whose observance is of the essence of justice.⁴⁸

3. "ALTERNATE (*amoibaos*) TIME."⁴⁹—"Alternate time" specifies what kind of justice this is: the egalitarian justice of rotation of office.

III. PARMENIDES

In Parmenides' Being the reference to justice is more explicit, and there is a stronger accent on its compulsiveness. There may be injustice among men, for they can overstep the limit of their own nature. There can be no injustice in Being, for its limit is an unbreakable "chain" (Frag. B8.26 and 31) or "fetter" (Frag. B8.14) which "holds it fast."⁵⁰ Justice or Necessity is thus spoken of as an active force. [But it is immanent in Being, since Being is all there is. What is there, then, about Being which accounts for this necessary justice? It is its self-identity or, as Parmenides thinks of it, its homogeneity or "self-equality." "It is all alike"; "it is equal to itself on all sides."⁵¹

⁴⁵ Cf. also Emp. Frag. B17.27.

⁴⁶ For the same association of the "great oath of the gods" with the establishment of a "prerogative" (*geras*), see Pindar, *Ol.* 7. 65; *Timē*, like *geras*, is the dignity of one's status in an ordered society (see Cornford, *From Religion to Philosophy*, p. 16). The scrupulous observance of its claims to deference is the basis of justice. For cosmological application of the idea see Soph. *Ajax* 660ff.

⁴⁷ Emp. Frag. B26.2: *en merel aisēs*. *Aisa*, like *moira*, originally "share," derivatively "appointed order" or "destiny," and thus, on the assumption that what is fated to be is right, "appropriate or right order" (cf. *hyper aisan* = *hyper dikēn*). Empedocles rationalizes *aisa* exactly as Parmenides (Frag. B8.37) had rationalized *moira*, and Anaximander (Frag. 1) *chreōn*. The latter means generally "fateful necessity," such as attaches to the prediction of an oracle, but (like *aisa* and *moira*) could also mean "right." In Heraclitus (Frag. B80) *chreōn* is equivalent to *dikē* in Parmenides (Frag. B8.9, 11, 45) it stands for logicophysical necessity. Fränkel goes too far in excluding "necessity" from the full meaning of *chreōn*: "Die Wörter des Stammes *chrē-* bezeichnen ein *Sollen* und *Schuldig Sein*, ein *Gebrauchen* und *Brauchbar Sein*, nicht ein *Müssen* und *Unvermeidbar Sein*" ("Parmenidesstudien", p. 183). What else but "Müssen und Unvermeidbar Sein" is the *chreōn* of an oracle?

⁴⁸ Cf. "the ordering of time" in Anax. Frag. 1.

⁴⁹ Cf. above, n. 38.

⁵⁰ See below, n. 159.

⁵¹ Frags. B8.22, *pan homoion*, and B8.49: *hoi panthothēn ison*. *Homoion* and *ison* are so closely connected at this stage of thought that geometrical equality may be expressed by *homoiotēs*: Eudemus *apud* Proclus *In Eucl.* {251.20–21 ἀρχαϊκώτερον δὲ τὰς ἰσους ὀμοιότητας (sc. Thales) προσεληχέναι.} For *homoios* with the sense of "equal in rank or dignity," see *LSJ* s.v. II.

For the historical source of this conception, we should look to Anaximander's theorem that the earth owed its stability to its all-around equality (*homoiotēta*).⁵² Aristotle's paraphrase of the theorem leaves us uncertain as to which of the words, if any, are Anaximander's own.⁵³ But taking the text at its face value, the similarity is striking: {161}

Problem

ANAXIMANDER: Why the earth is stationary (μῆναι).⁵⁴

PARMENIDES: Why Being is stationary (μῆναι).⁵⁵

Solution

ANAXIMANDER: Because it "is set at the center and is equally related to the extremes."⁵⁶

PARMENIDES: Because it is "like the bulk of a well-rounded sphere, equally poised from the center in every direction."⁵⁶

Anaximander is thinking of the earth, moving with the whirl, yet keeping its place.⁵⁷ The circumference of the eddy moves, the center also moves, yet the center is stationary with respect to the circumference.⁵⁸ Let us abstract from

⁵² *De caelo* 295b11ff. Stocks in the Oxford translation and Guthrie in the Loeb translation render *homoiotēs* here by "indifference." The sense is clear enough from the context, which refers specifically to the earth at the center of a circle (cf. the definition of the circle in Plato *Parm.* 137e; Arist. *Rhet.* 1407b27). In deducing the stability of the earth, "he clearly meant that the earth is in equilibrium" (Heath, *Greek Astronomy* [London, 1932], p. xxiii). *Isorropia* is not used here by Aristotle, but it is in Simplicius (*De caelo*, 532). Burnet objects (*Plato's Phaedo* [Oxford, 1911], commenting on *Phaedo* 109a3): "Anaximander's cylindrical earth could hardly be called *isorropia* like the Pythagorean spherical earth in the centre of a spherical *ouranos*." But Aët. 3.15.7 applies Anaximander's theorem with the word *isorropia* to Democritus, whose earth was anything but spherical.

⁵³ Stocks (in his note to *De caelo* 295b12, in the Oxford translation) observes: "From Aristotle's wording it seems probable that he had the *Phaedo* (109a) in mind here." But what did Plato have in mind? In the *Phaedo*? The conception, once launched by Anaximander, seems to have had a considerable vogue; Aët. 3.15.7 attributes it also to Parmenides and Democritus.

⁵⁴ *De caelo* 295b12 and 17; and *menousan* (sc. *gēn*) in Hippol. *Ref.* 1. 6.3.

⁵⁵ Frag. B8.29–30: ταῦτόν δ' ἐν ταύτῳ μίμνει καθ' ἑαυτὸ τε κείμεν χούτως ἔμπεδον αὐτῷ μῆναι (text as in Fränkel (above, n. 44), p. 186).

⁵⁶ Frag. B8.43–44; and cf. also 49: οἱ γὰρ πάντοθεν ἴσων.

⁵⁷ Eudemus Frag. 94 (= Anax. Frag. A26). Anaximander held that the earth is in mid-air *motionless* and that it moves about the world's center. That the "motion" is that of the whirl is not clear in our evidence, but it is a reasonable inference (see Heide, "The *Dine* in Anaximander's Theorem," *CP* 1 [1906] 279–82, and "On Certain Fragments of the Pre-Socratics," *PA* 37 [1913] 681–734, at 687–88). However, I agree with Burnet (*Early Greek Philosophy* 3rd ed. [London, 1930], p. 13n.3) that Heide went too far in assuming that the whirl was itself the "eternal motion" of the *apeiron* (see below, n. 140). Burnet's own argument for crediting Anaximander with the whirl (*Early Greek Philosophy*, p. 61) assumes that the "Pythagorean" cosmology of the *Timaeus* (52d–53a) implies an eddy. Cornford has since shown that this assumption is mistaken (*Plato's Cosmology* [London, 1937], pp. 290–92).

⁵⁸ Cf. Plato *Laws* 10.893c, where circles rotating *in situ* are described as having τῆς τῶν ἐστῶτων ἐν μέσῳ δύναμιν.

Anaximander's cosmological detail; keep only the part of the design which ensures the paradoxical triumph of stability over motion by virtue of equality (*homoiotēs*); allow for the fact that equality will be no longer an external relation and that the "extremes" are now the "limits" of Being itself; then what is left will be "like a well-rounded sphere, equally poised from the center in every direction."

Deprived of its cosmological application, the sphere is merely vestigial. It is only a simile; the round shape as such is irrelevant to Parmenides' thought: he is concerned only with the formal property of all-around equality.⁵⁹ In this sense the sphere makes a perfect vehicle for his conception of Being as "all alike," without distinction of "greater" and "lesser"⁶⁰ or of more and less complete,⁶¹ a whole whose parts are all equal among themselves, so that none can dominate any other.⁶² Thus absolute homogeneity means an internally secure equilibrium; and, since it is also secure against external disturbance, Being cannot move. It is "held fast" by its own "all-around equality."

The same property, applied to Truth, defines a perfectly "just" universe of discourse, for Truth, like Being, is "well-rounded"⁶³—a term which we must interpret [162] in line with Parmenides' own conception of the sphere as a whole whose parts are all equal among themselves. This is not a bad way to describe the purely deductive system which is Parmenides' norm of truth: in such a system (to use the language of a later logic), every proposition expresses an equivalence, and every difference masks an identity. This implies a perfectly coherent universe, without rifts or gaps.⁶⁴ Here inference can pass

⁵⁹ Fränkel: "Den Gegenstand des Vergleichs bildet nicht die Rundheit . . . sondern das ausgeglichene Kräftespiel (*isopales*) in einer so verteilten Gewichtsmasse (*ankos*)" (*op. cit.*, p. 191).

⁶⁰ Parmenides' terms are suggestive of "power," not mere volume (cf. above, pp. 58–59, 62); and they are charged with association of dignity (cf. the *timē* of Empedocles' roots): *cheiroteion*, *baioiteion*, and even *hēsson* (Frag. B8.24, 45, and 48) should be read in the light of the distinction in *timē* between the *megaloī* and the *baioī*, *megas* and *smikros* (e.g. Soph. *Ajax* 158–61) and *megas* and *oligos* (Callinus Frag. 1.17). Note the force of *eon eonti pelazei* (clearly a play on the proverb *homoion homoioi pelazei* [Plato *Symp.* 195b]) following the repudiation of *mallon* and *cheiroteion* (Frag. B8.23–24). Fränkel has some valuable comments on all this; see especially his remark on *mallon* in Frag. B8.48; "ein Adverb des Grades, nicht ein Adjektiv der Ausdehnung" ("Parmenidesstudien," p. 192). [But he objects, I think unnecessarily, to any spatial content in Parmenides' terms (p. 191). Why the either/or? Parmenides' denial of nonbeing entails, among other things, the rejection of empty space, this destroys differences in density as postulated by Anaximenes and entails a world "all full of being" (Frag. B8.24–25). To Parmenides this would make good sense in terms of both space and "power" (see also above, n. 36)]

⁶¹ Frag. B8.42–43 *tetelesmenon*.

⁶² The exact meaning of *isopalēs* (see above, n. 13, cf. Fränkel "Parmenidesstudien," p. 191n 1).

⁶³ An elegant instance of the general principle that "thinking and being are the same thing" (Frag. B3): they have the same basic properties.

⁶⁴ Coherence is asserted in Frag. B4 but only proved in Frag. B8.23–25, where "Being is *cuneches*" is inferred from "Being is *pan homoion*."

securely from the given to the not-given.⁶⁵ Here the starting-point becomes a matter of indifference: as on a circle, one can traverse the same line of truth from any starting-point whatever.⁶⁶ In such a world, thought is perfectly "just," i.e., in full accord with its own nature and the nature of Being.⁶⁷ Outside this world, thought is "forced"⁶⁸ to utter the unutterable and think the unthinkable. It thus attempts the impossible,⁶⁹ in defiance of the just necessity (*chreōn*) of thought and Being. This cannot injure Being, for it is "all inviolable."⁷⁰ But it can and does injure thought, foredooming it to "blindness," "wandering," and "helplessness."⁷¹

A final confirmation of the present thesis—that Parmenidean justice is grounded in equality—may be found in the cosmological appendix to the world of Truth and Being, which makes sense of the quasi-truth and quasi-being of the world of "mortal opinion." It is no use glossing over the harsh contrast between the two worlds: the first is Truth, the second opinion;⁷² the first is "unshaken" in its "trustworthiness," the second "deceitful" at its very best,⁷³ the first is "all alike," the second a mixture of two absolutely unlike powers. Nevertheless, Parmenides' account of the second is not a systematiz-

⁶⁵ Frag. B4.1: "see steadfastly with your mind things absent as though present." *Pareonta* here (cf. Emp. Frag. B106) should be interpreted in the same sense as *hokoiois' enkureōsin* (Archil. Frag. 68 [Dichl]), Heracl. Frag. B17, reading "hokosois enkureusin; Heracl. Frag. B72, cf. Emp. Frag. B2.5. *hotai prosekursen*), it is the tiny fragment of actual experience as against the *holon*. Parmenides feels that for those who have found the "light" the opposition of *pureon* and *apeon* has been resolved, to know anything is to know everything, since Being is *homon pan, hen, sone nos* (Frag. B8.5–6).

⁶⁶ Frag. B5 in conjunction with Heracl. Frag. B103, which it seems to echo (*xunon*). The *homoiotēs* of Parmenides' universe of discourse abolishes the distinction, axiomatic in Milesian thought and the earlier theogonies, between uncreated *archē* and created world. There *archē* was an absolute beginning for thought as well as for being; Parmenides denies this.

⁶⁷ Fränkel's interpretation is somewhat narrower: "*Dikē* ist also hier [Frag. B8.13–14] die Richtigkeit der Konsequenz, einer Konsequenz, die für die Sachverhalte ebenso bindend ist wie für das Denken über sie" ("Parmenidesstudien," p. 161).

⁶⁸ Frag. B7.3 *huasthō*. This is a different compulsion from that of *to chreōn*; it is "violence," which frustrates the intent of thought, while the just necessity of the limit is the condition of thought's self-fulfillment.

⁶⁹ Frag. B2.7: *ou gar annuston*.

⁷⁰ Frag. B8.48.

⁷¹ The state of the "wanderers" (Frag. B6.5–6; B8.54), their eyes "sightless," their hearing "full of noise," is that of humankind before Prometheus' gift of the arts ("seeing they saw not, hearing they heard not" [Aesch. *PV* 447–48; and cf. Heracl. Frag. B107]). *Amēchanē* is the Greek word for the helplessness of such a state. Theognis (140, 1078) uses *peirat amēchanēs* of the inscrutable *moira*, which brings him so often the very opposite of his intention.

⁷² *Alētheiē* (Frag. B1.29; 2.4; 8.51) versus *brotān doxas* and the like (Frag. B1.30; 8.51; 8.61).

⁷³ *Atrēmes* (Frag. B1.29); *pistis alēthēs* (Frag. B1.30); *pistos ischus* (Frag. B8.12), *piston logon* (Frag. B8.50) versus *kosmon emon epeōn apateion* (Frag. B8.52).

ation of current error.⁷⁴ It is original physical inquiry, attempting the same task to which the Ionians had addressed themselves, using their own categories and reaching results which are confidently proclaimed superior to theirs.⁷⁵ The general formula of this cosmology is defined [163] with astonishing precision, and it is formally identical with that of Empedocles: (1) each of the opposites is, like Parmenides' Being, absolutely self-identical;⁷⁶ (2) neither is, like Heraclitus' opposites, identical with its own opposite;⁷⁷ (3) both are equal.⁷⁸ On the meaning of equality here, our best clue is in Parmenides himself, who, as we have seen,⁷⁹ elsewhere uses "equal" as an alternate for "equally poised"; and this agrees perfectly with medical and Empedoclean usage. In the equipoise of opposite powers, Parmenides finds the next best thing to the internal equipoise of Being itself.⁸⁰ That is why the mock world of Light and Night is, in its own way, not chaos but cosmos⁸¹ and falls, like Being itself, under the sway of Just Necessity.⁸²

{—a wilful personification of the inexorable compulsiveness of logical inference, as it constrains our thoughts once we have found the right way to think about Being. And in the description of the object of our thought when so constrained, we note, as the objective correlate of Justice, the fact that all Being is *equally* Being: "it is all alike" and "equal to itself on all sides"^{82a} without distinction of "greater" or "lesser"^{82b} nor yet of more or less "complete": it is "complete all over (*tetelesmenon pantēi*) like the mass of a well-rounded sphere that is equally poised from the center outward in every direction (*messothē isopales*^{82c} *pantēi*)." The image is that of an object whose

⁷⁴ For this view, now generally abandoned, see Burnet, *Early Greek Philosophy*, pp. 182ff.

⁷⁵ I cannot agree with Verdenius (*Parmenides* [Groningen, 1942], pp. 56ff and 77–78) that Parmenides' "mortal opinions" refer *only* to the views of nonphilosophers. Parmenides' doctrine of Being contradicts the views of his philosophical predecessors no less than those of the man in the street, and as for his cosmology, "no mortal judgment shall ever outstrip" it (Frag. B8.61 [Cornford's trans.]); Verdenius correctly observes that "mortal" here includes even Parmenides himself *qua* mortal in a mortal world, a fortiori it would include every other philosopher.

⁷⁶ Frag. B8.57 *hedutōi pantose t' auton*

⁷⁷ Frag. B8.58 *tōi d' ἑτέρωι μὴ τούτῳ*

⁷⁸ Frag. B9.4: *isōn amphotērōn*

⁷⁹ Above, n. 36, and cf. n. 60

⁸⁰ Note the parallelism in the expressions. Frag. B8.24. *πάν δ' ἐμπλεόν ἐστιν ἔοντος* and Frag. B9.3: *πάν πλεόν ἐστιν ὁμοῦ φάεος καὶ νυκτός*

⁸¹ Frag. B8.60. *diakosmon eoikota*

⁸² Cf. the *Anankē* which "drove and fettered it (sc. the embracing Ouranos) to hold the limits of the stars" (Frag. B10.5–7 [Cornford's trans.]) with the *Anankē-Dikē-Moira* whose "fetter" hold the limits of Being itself.

^{82a} See above, n. 51.

^{82b} See above, n. 60

^{82c} A term expressive not of extensive but of dynamic equality: *pales* from *pallō* "to shake, poise, sway, brandish, wield (a spear, or missile)"; in pass., "to throb, vibrate, beat; to shake

motionless stability is due not to external fixtures or pressures but to the symmetrical distribution of its own internal forces.^{82d} The absolute "self-equality" of Being leaves no scope for anything within it which, by preponderating, could introduce injustice.

The notion of equality is also prominent in the cosmological appendix which makes sense of the quasi-truth and quasi-being of the world of "mortal opinion." The general formula of this cosmology is that there are two forms, Fire and Night, each of them as self-identical^{82e} in its own way as is Being itself, and that these two forms are "equal."^{82f} The meaning of this equality, unspecified in the physical fragments, may be interpreted in the light of Parmenides' use of "equal"^{82g} in a dynamic sense as an alternate for "equally poised"^{82h} in the doctrine of Being, and of Alcmaeon's concept of "*isonomia* of the powers." In the equipoise of physical opposites in the world of becoming, Parmenides would thus find a material parallel to the internal equipoise in Being. This would explain why he thinks of the mock world of Fire and Night as a cosmos,⁸²ⁱ falling, like Being itself, under the sway of Just Necessity.^{82j}

IV. HERACLITUS

Just as the self-identity of Truth and Being *is* justice for Parmenides, so the "strife" of Becoming *is* justice for Heraclitus.⁸³ Here, too, we find, among the mediating concepts, necessity (*chreōn*)⁸⁴ and measure: "The earth is poured out as sea, and is measured according to the same *logos*⁸⁵ as before it becomes earth" (Frag. B31). "Strife" *is* justice because, through the very conflict⁸⁶ of

(lots) together," R. J. Cunliffe, *A Lexicon of the Homeric Dialect* (London, 1924), s.v. Cf. its use by Plato in *Tim.* 62e, *στερεὸν κατὰ μέσον τοῦ παντός ἰσοπαλές* (almost certainly an echo of *messothē isopales* in Parmenides, which is quoted by Plato in *Soph.* 244e, by Aristotle in *Phys.* 207a17) to denote a solid with an *equal tendency* to move in any given direction away from the center. Herodotus (5.49.8) uses it of opposing states so evenly matched in strength that neither could count on a victory over the other and (1.82.4) of contending armies stalemated in a battle.

^{82d} See n. 59

^{82e} See n. 76

^{82f} See n. 78

^{82g} Above, note 51

^{82h} Above, nn. 82c and 59

⁸²ⁱ See n. 81

^{82j} See n. 82

⁸³ Frag. B80 *kai dikēn erin*

⁸⁴ Frag. B80 *kai erin kai chreōn*

⁸⁵ I. I. Marmar, Jr., rightly calls attention to the primary significance of *logos* as "computation," *CP* 34 [1939], 323. [Perhaps "value" would be a better rendering here, conveying the double sense of "worth" (cf. *hou pleōn logos* [Frag. B39] and its measure" [Frag. B90]).]

⁸⁶ Frag. B36: each lives the other's death

the opposites, the measure will be kept. This means (1) that in every transformation the fire which is "exchanged"⁸⁷ remains constant and (2) that the distribution of fire among the opposites is also constant: "The way up and down is one and the same" (Frag. B60), which I take to mean that the sum total of "upward" changes in the universe equals the "downward" ones,⁸⁸ so that the middle term, water, is exactly divided between the two ways, half of it "turning" to earth and the other half to fire.⁸⁹

Much could be said of the similarities of this design to the Empedoclean. Both are inspired by the principle of the "hidden" harmony (Frag. B54) of Harmony itself with its own opposite, Strife,⁹⁰ achieved in both systems by assuming that these, like [164] all other opposites, balance.⁹¹ But there are important divergences both in structure and in intention; and these are material to the role of equalitarian justice in the two cosmologies. The structural differences are mainly two: (1) the universe has not yet been parceled out into six separate sets of Parmenidean being; nor (2) has its history been marked off into separate epochs of successive supremacy. Because of 1 it would be useless to look for the formal equation of physical roots. Everything in Heraclitus' world is in process; instead of equality between substantives of permanence, we find reciprocity between verbs of change. For everything "turning"

⁸⁷ Frag. B90, and see the parallel passages to this fragment in Bywater's edition of Heraclitus (Frag. 22 there).

⁸⁸ Philo (*De incorr. mundi* 108-9) puts much the same interpretation on this fragment. He speaks of "reciprocation [*antektasis*] and interchange according to standards of equality and the bounds of justice." He also speaks of the interchanges as *isonomia* (112; cf. also *ισοκρατής* ἡ τῶν στοιχείων μεταβολή [116] and a similar passage in *De cherubim* 109-12 esp. 110 ἀντιδοσὶν τινα καὶ ἀντέκτιαν πάντα ὑπομένοντα). Philo here is not merely echoing Stoic doctrine, though his immediate source may be Stoic, for he is arguing against the Stoic *ekpurōsis*; and he has a fair knowledge of Heraclitus, as one can see by his quotations and allusions. See further, below, n. 154.

⁸⁹ Fr.-g. B31a, following Burnet's interpretation (*Early Greek Philosophy*, p. 149).

⁹⁰ The prototype of this idea, I surmise, was Anaximander's *dinos*. The effect of *dinos* and *dinēsis* is to unsettle the established order of things: *kukaein*, *turastein* (e.g., Plato *Crat.* 439c, Aesch. *Ag.* 987, Pind. *Pyth.* 9.38; Emp. Frag. B110.1). Thus the *dinos* shook the *aperron* out of its proper state, the *krasis* of the opposites. But, strangely enough, the effect of this unsettling was not chaos but cosmos. To Heraclitus this must have seemed a perfect instance of the "hidden" harmony and the unity of opposites. Though the *dinos* has no place in his own cosmology, he does refer to an analogous instance in Frag. B125 (Frag. 84 in Bywater); and the point is still clearer in the form in which the fragment is quoted by Alexander Aphrod. (cited by Bywater, *ad loc.*): ὁ δὲ κυκλών, ὥσπερ καὶ Ἡράκλειτός φησιν, ἐὼν μὴ τις ταράττη, διίσταται.

⁹¹ The assumption that not only Love-Strife but the four "roots" as well are conceived as opposites by Empedocles may be questioned. But see Emp. Frag. B21.3-6: fire is "bright and warm," while water is "dark and cold," the earth is "close-pressed and solid" while—if we may fill in the fourth term which does not occur in the context—the air would be rare and light (as, e.g., in Parm. Frag. B8 56-59, "rare" and "light" appear as the opposites to "compact" and "heavy") [It would be strange indeed if Empedocles employed the concept of *krasis* without its universal accompaniment that it is a balance of opposites.]

one way, something else is "turning" the opposite way: "cold things grow hot, the hot grows cold; the moist grows dry, the dry grows moist" (Frag. B126).⁹² Because of 2 the world is not made and unmade in alternate eons⁹³; generation and destruction are concurrent and constant, hence the form of the world is also constant. Fire, "kindled" by "gathering" into its own substance a measure of fuel, is also "extinguished" by "scattering abroad" the same measure of light.⁹⁴ This measured give-and-take accounts for the permanence of the world which "was and is and is to be."⁹⁵

But there is another difference which may well be intentional: the words *equal* and *equality* never occur in the fragments.⁹⁶ To express the harmony of the opposites, Heraclitus does not say that they are equal but that they are one;⁹⁷ to express their equivalence, he says that they are "the same thing."⁹⁸ This is no verbal accident. It is true to a pattern of thought which separates him from Anaximander (as well as from Empedocles) and brings him closer to Anaximenes: the physical opposites are all explained as modifications of one of them; they are thus literally "the same thing."⁹⁹ [165] This One is the

* Cf. the *troupe* of water, equal parts turning in opposite directions (see above, n. 89).

⁹² Burnet's argument against the ascription of the periodic conflagration to Heraclitus has been strengthened by Reinhardt, *Parmenides* (Bonn, 1916), pp. 169ff. [Two] (A) further points may be added [(1)] Philo (cited above, n. 88) quotes Heraclitus *against* the Stoic conflagration; [and (2)] Cherniss suggests that Aristotle's ὥσπερ Ἡράκλειτός φησιν ἅπαντα γίνεσθαι ποτε πῦρ (*Phys.* 205a3) does not mean "that all things at some time become fire" but rather "that fire at some time becomes everything" (sc. in the course of its circulation on the way "up" and "down") (*Aristotle's Criticism of Presocratic Philosophy* [Baltimore, 1935], pp. 29, 108).

⁹³ Combining Frags. B30 and B91; cf. Arist. [*De univ.* 470a3-4: "fire is ever coming into being and flowing like a river." Fire is the "eater" par excellence (*De gen. et cor.* 335a16);] "it can live only as long as it is fed, and the only food for fire in moisture" (*Meteor.* 355a4-5; and cf. Galen in Hippocr. *De nat. hom.* 1.39: "and fire . . . manifestly needs moisture for its nourishment, as the flames of [oil-] lamps show"). The last point has not always been understood, even by close students of Greek science (e.g., Tannery, *Pour l'histoire de la science hellène*, p. 175); yet that is what accounts for Heraclitus' triad fire-water-earth on the way up and down: fire and moisture ("water") are juxtaposed in "concordant discord" (Plato *Symp.* 187a); fire is fed by its "enemy" (cf. Aesch. *Ag.* 650-51).

⁹⁴ See Reinhardt, *Parmenides*, p. 176n. 2: "Die Worte ἦν τε καὶ ἔστι καὶ ἔσται [Frag. B30] immutabel, ein Ausdruck für die Unveränderlichkeit," and citations.

⁹⁵ Not *homoeion* and *homoiotēs*.

⁹⁶ E.g., Frags. B50: "all things are one," and B67, "god" is day-night, winter-summer, war-peace, surfeit-hunger.

⁹⁷ E.g., Frag. B88: the equivalence of contraries is shown through the fact that a *metapeson* becomes *not-a*, and *not-a* *palin metapeson* becomes *a*; the logical upshot is that *a* and *not-a* are the same thing. Alternatively, Heraclitus will say that *a* is *not-a*—Frag. B62 "immortals (are) mortals, mortals (are) immortals, etc." Finally, he will say that a thing is "one and the same" as its opposite (e.g., Frag. B60, of the upward and downward ways, where what he means is obviously not identity but equivalence).

⁹⁸ Anaximenes' wording is, of course, lost to us; but that of his fifth-century follower, Diogenes of Apollonia, agrees verbally with Heraclitus—Frag. B2: πάντα τὰ ὄντα . . . τὸ αὐτὸ εἶναι . . . τὸ αὐτὸ ἐὼν μετέπτετε πολλαχῶς. To be sure, there is a difference: Unlike Anax-

"common" thing throughout the universe.¹⁰⁰ And, since it defines the measure of every process (Frag. B90), Heraclitus thinks of it as the "one divine law," all-powerful, all-sufficient, all-victorious (Frag. B114). It is the "thought which governs all things through all things" (Frag. B41).¹⁰¹

Should this doctrine of the One "governor" of the universe be interpreted in line with the "aristocratic" politics with which Heraclitus is commonly credited in the textbooks?¹⁰² It is clear enough that he was a misfit in Ephesian politics.¹⁰³ This is in striking contrast to Anaximander, Parmenides, and Empedocles, all of whom seem to have held posts of authority and influence in their respective states.¹⁰⁴ But from this we cannot jump to the conclusion that Heraclitus was a partisan of aristocracy in its relevant, historical sense.¹⁰⁵ His tirades against the "many" follow logically enough from his basic conviction that they are philosophically benighted.¹⁰⁶ But the philosopher's contempt for the folly of the crowd is not peculiar to Heraclitus. Parmenides shared

menes' (and Diogenes') air, Heraclitus' fire is not an original substance from which the world evolved, but the "ever living" power in the world (Frag. B30). On the other hand, the two systems are precisely similar in that the "one" appears in the world in a double role: it is itself one of the opposites, yet it explains the unity in all the opposites; it is both one among the many and the one which is the many.

¹⁰⁰ See below, n. 108. Heraclitus uses *xunon* as an alternative to *t'auto* to express the equivalence of opposites as, e.g., in Frag. B103.

¹⁰¹ Anaximenes' air no doubt performed a similar function (Anaximenes Frag. B2, Diogenes Frag. B5).

¹⁰² I. g. J. B. Bury, *History of Greece* (Modern Library ed.; New York, 1937), p. 305: "he was an aristocrat in politics." Zeller, *History of Greek Philosophy*, English trans. (London 1891), 2, 99: "he hates and despises democracy"; this position remains unqualified in the sixth German ed. by Nestle (1920).

¹⁰³ We can infer as much from Diogenes Laertius (9.1-6), without taking too seriously his various stories. There is no reason to doubt the fact that Heraclitus renounced a hereditary *basileia* in favor of a brother (Antisthenes of Rhodes *apud* Diog. Laert. 9.6); but the facile interpretation of the motive (*megalphrosunē*) is another matter. Temperament and politics aside, would his attacks on the mysteries (Frag. B14) and the purification ritual (Frag. B15) be compatible with the duties of a priestly office?

¹⁰⁴ Anaximander Frag. A3, Emp. Frag. A1 (Diog. Laert. 8.64, 66) and Bignone, *Empedocle* (Turin, 1916), pp. 78-79; Parm. Frags. A1 (Diog. Laert. 9.23) and A12: a commercial city, founded by Ionian émigrés, Elea was probably a democracy.

¹⁰⁵ Diogenes Laertius' statement (9.2) that Heraclitus declined the invitation to "give laws" to Ephesus is unsupported by creditable authority. If true, it would only suggest that the demos did not think him an aristocratic partisan.

¹⁰⁶ Jaeger (*Paideia* I, 180ff.) rightly insists on the unity of theory and practice in Heraclitus. Wisdom (*sophiē*) includes both "word and act" (*epē - erga* [Frag. B1]; *legein - poiein* [Frag. B112 and B73]). The many who live like dreamers, each in his private world (Frag. B89, B73), cannot "follow the common" (Frag. B2). This indictment cuts across class lines. The "many" are not the demos but all who fail to meet the austere standards of Heraclitean wisdom, including the illustrious company of Homer, Hesiod, Archilochus, Pythagoras, Xenophanes, Hecataeus (Frag. B40, B42).

it; and so did Empedocles, whose loyalty to democracy is well attested.¹⁰⁷ What is peculiar to Heraclitus is, rather, the doctrine of the "common": truth is the "common"; the world is "common";¹⁰⁸ and in the state, law is the "common."¹⁰⁹

This concept of the state as a community, united by a common stake in a common justice, is perfectly compatible with democratic politics. Early in the sixth century, it had inspired the Solonian reform program.¹¹⁰ It survived throughout [166] the fifth century and into the fourth as a cherished doctrine of Athenian democracy.¹¹¹ Thus the doctrine of law as "common" remains constant throughout a period of sweeping change within the democratic tradition. The vital choice in democratic politics in Heraclitus' day was whether to accelerate or to resist this development; whether to press forward toward the radical equalitarianism of the lot and "ruling in turn" or else adhere to the earlier democracy, predicated, as in Solon, not on equal dignity but on common justice.¹¹² If our meager evidence permits any hypothesis concerning Heraclitus' political sympathies, it would be that he favored the limited democracy of the past. This is in line with his known admiration for Bias of Priene, who figures in the tradition as an early democratic statesman.¹¹³ Indeed, Heraclitus' saying, "the many are bad" (Frag. B104), is also traditionally ascribed to Bias.¹¹⁴ And Heraclitus' doctrine that the city "strengthens" itself

¹⁰⁷ Cf. "mortal opinion" in Parmenides (above, n. 72) and Empedocles (Frag. B2.7-8; B3.1, etc.). Contempt for the ignorance of the public (cf. Hecataeus of Miletus Frag. 1a; *On the Sacred Disease* 1.3-5) need not of itself imply rejection of democracy except on the further assumptions that (1) this ignorance is incurable and (2) the enlightened would fare better under some practicable alternative to democracy.

¹⁰⁸ Cf. Frags. B89, B30. In Frag. B80, *xunon* bears the same relation to *dikē* and *chreōn*, as "war" to "strife"; the "common" in Heraclitus denotes the same category of rational necessity which appears as *anankē-dikē* in Parmenides.

¹⁰⁹ Frag. B114. Here the law is clearly the "common" thing in the *polis*, and as such the source of its strength. Hence "the demos must fight on behalf of the law as for the city-walls" (Frag. B44), i.e., as for the supreme condition of its common freedom. Similarly, in Frag. B43, "*hubris* must be extinguished even more than a conflagration," the reference is again to a common peril.

¹¹⁰ See my "Solonian Justice," pp. 68-75 and 82-83 (*1.36-46, 55-56).

¹¹¹ E.g., Eurip. *Suppl.* 430-32; Demosth. 21.30ff.

Solon's common justice does imply "equal" laws (Frag. 24.18 [Diehl]), literally, "like," *homotōs*, but see above, n. 51). But these equal laws do not annul the vested inequalities in dignity between the social classes. Solon clearly thinks of himself as conserving the difference in "honor" and "prerogative" between the demos and their social superiors (Frag. 5 [Diehl]). His cession of *isomouria* in land is a corollary (Frag. 23.21 [Diehl]).

There is good evidence of his reputation as a "pleader" (Hipponax Frag. 79 [Bergk]), this suggests that, whatever his political power at Priene, it was not above the law. Plutarch (*Moralia* 862d) lumps his career with that of Pericles as examples of praiseworthy statesmanship. Of Priene's constitutional history we know next to nothing. But it is fair to assume that early in the sixth century its constitution, like that of other commercial Ionian cities, was at least moderately democratic.

¹¹⁴ Diog. Laert. 1.88.

through the law has an obvious affinity to Bias' reputed saying that "the strongest democracy is the one wherein all fear the law as their master."¹¹⁵

From this perspective we should interpret those fragments in Heraclitus which exalt the "one" against the "many."¹¹⁶ The core of his politics is the supremacy of the "common"—law. "And it is law, too, to obey the counsel of one" (Frag. B33) can only mean: the will of "one" is law only when it expresses the "common" to which all (including the "one") are subject.¹¹⁷ So, too, we must think of the cosmic supremacy of fire in Heraclitean physics, not as the predominance of a single power but as the submission of all powers to a single law. For if we think of fire as itself one of the powers, then it must keep its equal place among the rest. Thus water is absolutely impartial as between fire and earth, its two neighbors (and enemies) on the way up and down: it dies into earth as much as into fire; it lives from fire as much as from earth. Or if, conversely, we think of fire not as one of the many but as the One which is the many, then fire is not a separate power lording it over the rest; its justice is simply the common measure in all [167] the powers. If everything is fire, then the "government" of fire in the cosmos is cosmic self-government.¹¹⁸

V. ANAXIMANDER

We must reckon, finally, with the oldest and most controversial text in pre-Socratic philosophy, Anaximander's Fragment 1:

And into those things from which existing things take their rise, they pass away once more, "according to just necessity [*chreōn*], for they render justice and reparation to one another for their injustices according to the ordering of time."¹¹⁹

¹¹⁵ Plutarch *Moralia* 154d. The obvious comparison is with Demaratus' words to the Persian king in Hdt. 7.104: "Law is their despot, whom they fear much more than your men fear you." This doctrine of *despotēs nomos* sounds—and is—Spartan. But it is not opposed to democracy as such, but to Persian absolutism; it is matched in Aeschylus (e.g., *Eum.* 516–27 and 698–99). Its broader formulation in Demaratus' first speech to the king (Hdt. 7.102)—"virtue is acquired, wrought of wisdom and strong law"—is explicitly applied to "all Greeks." It could certainly be taken as the maxim of both Solonian and Heraclitean morality.

¹¹⁶ Frags. B49, 99, 110, 121. The point of Frag. B121 should not be blunted by rendering *onēistos* "best" or "worthiest," as in Cicero (*nemo de nobis unus excellat*) and subsequently in the textbooks. Hermodorus' intrinsic worth is not in question here. Heraclitus' point is that the Ephesians are losing the man who would be pre-eminently useful to the community and thus to themselves.

¹¹⁷ The form of this fragment suggests the possibility that it is a qualifying antithesis to a preceding generalization: e.g., law is common counsel (cf. Frags. B114, B2, B113), but "it is law, too, to obey the counsel of one." At any rate, a comparison with Frag. B114 shows that the ultimate "one" on which all human laws rest is the "common mind" (= "the one divine law").

¹¹⁸ The Greek term *autonomos* (below, n. 165) fits Heraclitus' thought exactly: the universe is "a law unto itself"; its law is inherent in its own nature, not imposed upon it by a superior.

¹¹⁹ Diels-Kranz start the citation with *ex hōn*. But Burnet's (*Early Greek Philosophy*, p. 52n. 6)

Any reasonable interpretation of these words calls for justification; and this involves unavoidably the evaluation of certain Aristotelian texts which form our most important collateral evidence. I have left this last so as to approach it in the light of Heraclitus, Parmenides, Empedocles, and the medical writers: their thought-forms are safer guides to Anaximander than are the categories of Aristotelian physics. Yet, even so, we must respect what we know of the development of pre-Socratic thought and guard against reading into Anaximander atomic physics or Parmenidean logic.

A. Equality of the Opposites

Aristotle writes: "Some people make not air or water the infinite, but this [*sc.* "something distinct from the elements"]¹²⁰ in order that the other elements may not be destroyed by the element which is infinite. They are in opposition to one another—air is cold, water is moist, fire hot. If one were infinite, the others would have been destroyed by now. As it is, the infinite is something other than the elements, from which they arise" [*Phys.* 204b24–29].

Anaximander is not named here. But the identification is made in Simplicius, and there is no good reason to question it.¹²¹ What the argument aims to prove is fortunately clear enough from independent evidence. We know that the first generation or two of Ionian thought *did* turn one of the opposites into the boundless source of everything else. This is obvious for Anaximenes' air. In the case of Xenophanes, we have his own words, off-hand, untechnical, and all the more valuable on that account: the earth has its upper limit just where you see it, "next to your feet"; as for its lower limit, there is none—"it

and Heidel's ("On Anaximander," *CP* 7 [1912], 212–34, at 233) doubts with regard to *tois outi*, *genesis*, and *phthora* in the first clause have never been properly answered. *Phthora* is particularly open to suspicion. It never occurs as an abstract noun in any pre-Socratic fragment (Democ. Frag. B249 has an obviously different meaning). Parmenides, whose polemic against the Ionians reflects their terminology, uses *olethros* (and the verb, *ollunai*). That Anaximander, too, would use *olethros* instead of *phthora* is probable from *anōlethron* in Arist. *Phys.* 203b14, quoting *Anaximander*, in place of *aphtharton* in line 8, where Aristotle is using his own words. As for *phthoran genesethai* for *phtheiresthai*, is this likely at this stage of philosophic prose?

¹²⁰ *Phys.* 204b23–24. *to para ta stoicheia*. The phrase serves well enough to distinguish Anaximander's *archē* from its derivatives. Aristotle's interpretation of the phrase—as a "sensible body" which ought to be "present in our world here" (lines 32–34)—may be disregarded; it is clearly not Anaximander's own thought but a construction which Aristotle puts upon it for polemical purposes.

Cherniss rejects it as "the peculiarly Aristotelian argument of the necessary equilibrium of contrary forces" (*Aristotle's Criticism of Presocratic Philosophy*, p. 376), referring to *Meteor.* 340a1–17. But the latter is itself an Aristotelian adaptation of the old physical and medical doctrine of *isonomia ton dunameōn*. Here (and also in *Phys.* 204b14–18), Aristotle enriches the argument with various other notions of his own; these are absent from *Phys.* 204b23–29, especially the distinction between "power" and "bulk," which is foreign to the medical literature and the earlier philosophers (see above, p. 62).

goes on endlessly" (*eis apeiron hikneitai* [Frag. B28]).¹²² Thales' water, too, must [168] have been as endless as Xenophanes' earth and in the same sense: it must "go on endlessly," for it supports the earth, while no provision is made for its being supported, in turn, by anything else.¹²³ Thus, in denying infinity to any of the opposites, Anaximander was going against the general trend. He could only have done so for a good reason. The argument in *Phys.* 204b24–29 supplies the reason: to safeguard the equilibrium among the opposites.

That the main components of the universe are equal was an old tradition in popular cosmology. In *Il.* xv it is implied that the heavens, the sea, and "the murky darkness" are equal, since their respective lords are equals in "rank" and "portion."¹²⁴ In Hesiod earth and heavens are declared equal (*Theog.* 126); and the distance between heavens and earth is equal to that between earth and Tartarus (*ibid.* 719–25). Such ideas are mainly without even a semblance of physical justification.¹²⁵ They boldly read into the universe that feeling for symmetry and balance which makes the *Odyssey* speak of a well-made ship as "equal"¹²⁶ and of a wise, balanced mind also as "equal."¹²⁷ Anaximander's own cosmology is designed with just such a sense of aesthetic symmetry, with equality as the main motif: the intervals between each of the infinite worlds are equal;¹²⁸ the intervals between earth, fixed stars, moon, and sun are also equal;¹²⁹ earth and sun are equal;¹³⁰ the two landmasses of the earth—Asia and Europe—are equal, and the two great rivers in each are equal and divide the regions through which they flow into equal parts.¹³¹ To

¹²² Aristotle (*De caelo* 294a22) paraphrases Xenophanes' doctrine as follows: *ep' apeiron autēn* [sc. the earth] *errizōsthai*. Xenophanes seems to be combating the Hesiodic view that the *gēs rhizai* start somewhere, i.e., from Tartarus (*Theog.* 728).

¹²³ That the earth floats on water is well attested (Thales Frags. A13, A14, and A15) and a surer ground of inference than the conflicting tradition on the question as to whether or not Thales' water was boundless (Theophrastus versus Simplicius in Thales Frag. A13). Anaximander may well have been the first to name his *archē* "Boundless" (so Theophrastus *apud* Simplicius *Phys.* 24.15–16).

¹²⁴ See above, n. 8; and Cornford's discussion of the passage in *From Religion to Philosophy*, pp. 15–16.

¹²⁵ Only for the equality of heavens and earth in the *Theog.* 126–27 can one conjecture a rough appeal to observable fact, i.e., the apparent coincidence of the visual horizon with the base of the celestial hemisphere.

¹²⁶ *Il.* 508, {*koiētēs epi nēos eisēs*}. The most striking example of this use of equality to express geometric symmetry is the definition of the straight line in Euclid: ἡτὶς ἐξ ἴσου (i.e., symmetrically) τοῖς ἐφ' ἑαυτῆς σημείοις κείται.

¹²⁷ *Il.* 11.337, {*phrenas . . . eisus*} [14 178, etc.]

¹²⁸ *Aët.* 2.1.8

¹²⁹ From the data in Hippol. *Ref.* 1.6.5. *Aët.* 2.20.1 and 2.21.1; with Tannery's reasonable conjectures (*Pour l'histoire de la science hellène*, pp. 94f.).

¹³⁰ *Aët.* 2.21.2. Strictly speaking, this means that the diameter of the circular vent of the sun-ring which constitutes the visible sun is equal to the diameter of the earth.

¹³¹ All this, of course, on the assumption that the geography of "the Ionians" in *Hdt.* 4.36 and 2.33 is substantially derived from Anaximander (via Hecataeus) and conserves his accent on equality (see Jaeger, *Paideia* I, 155–56).

cap all this with the equality of the opposites which constitute this world would be in fine harmony with the whole design. The argument in *Phys.* 204b24–29 takes us beyond this aesthetic presumption into physical reasoning: If one of the opposites were boundless, it would not only mar the architectonic elegance of the cosmology but would positively "destroy" the other opposites.¹³² Why so? Because—as we know from Fragment 1—the opposites are constantly encroaching upon one another. If one of them were limitless, there would be no stopping it by the rest, singly or in combination, for they are all limited. Its encroachment would continue until the rest were destroyed.

B. Justice in the Boundless

We may now settle accounts with the older interpretation of Fragment 1: that the very existence of the cosmos is itself an injustice against the Boundless, to be [169] expiated by reabsorption.¹³³ This was the general view before the restoration of the words "to one another" (*allēlois*) in the second clause; thereafter, it was left without firm foothold in the text and has been largely abandoned.¹³⁴ What still gives it a measure of plausibility is the suggestion in the first clause that "reparation" is somehow connected with "passing away";¹³⁵

Cf. the association of encroachment ("injustice") with "destruction" by Eryximachus in Plato *Symp.* 188c.

¹³² Jaeger observes (*Paideia* I, 159) that this is not a Greek idea. Certainly, it is alien to the pre-Socratics. The least objectionable version of the view is in O. Gilbert, "Spekulation und Volksglaube in der ionischen Philosophie," *Archiv für Religionswissenschaft*, 13 (1910), 312. He thinks that the divine energy "stufte sich, je weiter es sich von dem Urquell der Gottheit [sc. the Boundless itself] entfernte, mehr und mehr ab." Even so, I see no good reason for reading this Neo-Platonic notion into Anaximander. Hippol. *Ref.* 1.7.1 (Diels, *Dox. Graeci* [Berlin, 1879] 560 13–15), to which Gilbert appealed, does not bear out the interpretation he put upon it.

¹³³ Diels clung to it to the end (see "Anaximandros von Milet," *Neue Jahrbücher für das klassische Altertum* [1923], p. 69). For a more recent defense, see Mondolfo, "Problemi del pensiero antico" (1935), chap. 2; also his "La Giustizia cosmica secondo Anassimandro ed Eracinto," *Civiltà moderna* [1934]. He argues that, because "injustice" is normal (he compares war and strife in Heraclitus), existence is inherently unjust ("La Giustizia," p. 416), and thus a collective sin against the "universal law of harmony and unity" (*ibid.* p. 418). But this misses the whole point of the equation of reparation and encroachment which ensures that, on balance, existence is always "just." Mondolfo writes of Heraclitus: "Generated and existing only through war, individual things exist through each other's destruction and thus through *hubris*" (*ibid.* p. 416). But *hubris* is not in Heraclitus, except in Frag. B43, where the reference is not cosmological. As for war and strife, whatever we may think of them, they passed at the time for perfectly proper instruments of justice—so much so that *neikos* could stand for action-at-law (e.g., *Od.* 12.440, *Hesiod Op.* 232); *eris* could mean simply "cause" (e.g., Aesch. *Suppl.* 644–45: *atimōsantes erin kunakōn*); and even participation in *stasis* could be made a matter of statutory obligation by Solon (*Arist. Ath. pol.* 8.5, *Plut. Solon* 20.1). As I have argued in the text, because inverse processes of "strife" balance in Heraclitus, his own statement that "strife is justice" makes sense from "god's" standpoint there is no injustice (Frag. B102). His system not only expels *hubris* and injustice from the cosmos but employs strife as an essential instrument in their expulsion.

¹³⁴ I follow Cherniss (*Aristotle's Criticism of Presocratic Philosophy*, p. 376) in assuming that

how can things "render justice and reparation to one another in a process which destroys their very existence? Unless this paradox can be resolved, we shall find ourselves drifting back into the older view, even after formally abandoning it; we shall be constantly tempted to think of the Boundless itself as the payee of the "damages" and, consequently, as itself the victim of the original injustice.

We may approach the answer by way of the little-noticed fact that the fragment refers in the plural¹³⁶ to the matrix from which all things arise and to which they all return. This is strange, for the reference is obviously to the Boundless, and this is plainly singular. The shift to the plural can mean only that in this context the Boundless is explicitly thought of as a plurality,¹³⁷ this is in line with what Aristotle tells us in *Phys.* 187a20–22, where he speaks of Anaximander's opposites (*enantotētas*) as being "contained in" (*enousas*) the "one" and issuing from it by a process of "separation" (*ekkrinesthai*). Burnet ruled against this statement as "not even a paraphrase of anything Anaximander said."¹³⁸ But his objection to Aristotle's word for "contained in" (*en-einai*) as "unhistorical"—his only definite reason for the sweeping condemnation of the text—is completely unfounded. The same word occurs frequently [170] in the pre-Socratics and the medical literature with the very sense required in the present context, i.e., the relation of any ingredient to the compound of which it forms a part.¹³⁹ As for the other terms used here by Aristotle—*separation* and *oppositions*—both refer to characteristic concepts of Ionian medicine and physics and accord perfectly with what we know of Anaximander's system. The "opposites" are obviously "the hot, cold, dry, moist, and the rest" (*Simpl. Phys.* 150.24), which are the main components of his cosmology. "Separation" is the basic cosmogonic category of Ionian thought, the process by which "the heavens and all the infinite worlds" are formed in Anaximander.¹⁴⁰

the first clause, though probably only paraphrased (see above, n. 110), does convey the substance of Anaximander's thought. We would save ourselves a good deal of exegetical trouble by assuming (with Heidel, "On Anaximander," pp. 233–34) that the thought, as well as the wording, is not Anaximander's but Theophrastus'.

¹³⁶ Cherniss (*Aristotle's Criticism of Presocratic Philosophy*, p. 377) observes that the standard translations obscure this point by turning the plural of the original (*ex hōn . . . eis taūta . . .*) into the singular. Thus Burnet translates, "Into that [= *eis taūta*] from which [*ex hōn*]. . ."

¹³⁷ Cherniss (*Aristotle's Criticism*, p. 377) infers an unlimited plurality. From Simplicius' statement "opposites are hot, cold, dry, moist, and the rest" (*Phys.* 150.24–25), we may infer that Anaximander assumed a great number of opposites (as did Alcmaeon: "the wet, dry, cold, hot, bitter, sweet, and the rest" [Frag. B4]). But to say that he assumed an infinity of opposites goes beyond our evidence and leaves unexplained the practice of Aristotle and his school, who regard this as the innovation of Anaxagoras (e.g., Theophrastus *apud* Simplicius *Phys.* 27.4).

¹³⁸ *Aristotle's Criticism*, p. 57n. 1

¹³⁹ For the pre-Socratics, see Kranz's *Wortindex*, s.v. *ἐνείναι*. For the medical literature see, e.g., *Ancient Medicine* 14.29, 31; 16.6; see also instances cited by H. C. Baldry in "Plato's 'Technical Terms,'" *CQ* 31 (1937), 141–50, at 146.

¹⁴⁰ Ps. Plut. *Strom.* 2. For a good discussion of "separation," see Heidel, "On Anaximander,"

There is, nonetheless, a residual problem here: If the *apeiron* is a compound of opposites, why should Aristotle think of it as "one" and contrast it as such with the "one and many" of Empedocles' *Sphairos* and Anaxagoras' primitive mixture?¹⁴¹ The answer is surely that Empedocles and Anaxagoras both thought of their original compound as made up of Parmenidean bits of Being, eternally self-identical in the mixture as in the world which issues from it.¹⁴² This is just what we cannot ascribe to Anaximander without anachronism: he thought of his Boundless as "one" in a far more intimate sense than would have been possible for a physicist schooled in Parmenidean logic. That logic compelled Empedocles to revise the basic concept of *krasis* and to think of it as a mere juxtaposition of minute particles.¹⁴³ For the unreformed doctrine of *krasis*, we may look to the anti-Empedoclean *On Ancient Medicine*, which speaks of a compound in *krasis* as "one and simple."¹⁴⁴ This seems to be our best clue to the sense in which Anaximander's Boundless is "one": it does "contain" the "opposites"; but these are so thoroughly mixed that none of them appear as single, individual things.¹⁴⁵ This would explain why Aristotle and his school commonly refer to Empedocles' principles (*archai*) as six and to Anaxagoras' as infinite in number, while they invariably speak of Anaximander's principle as one.¹⁴⁶ And it would further explain what we must understand by the Aristotelian term "indeterminate" (*phusis aoristos*) as applied to Anaximander's Boundless. Just as in a [171] Hippocratic compound in *krasis* the individual opposites are "not apparent,"¹⁴⁷ so neither are they in

pp. 229–32. But Heidel's suggestion that *ex tou aidion* in Pseudo-Plutarch means "from eternity" has not found favor. The correct rendering of the whole phrase (Diels, *Dox. Graeci* 579.13–14) seems to me to be, "something productive of hot and cold was separated off from the eternal" (adapted from Burnet's translation). That the process which generates the hot and the cold should be spoken of in the passive voice as itself "separated off" sounds strange perhaps; but cf. Democ. *frag.* B167: *δίνον ἀπὸ τοῦ παντός ἀποκριθῆναι*. "Productive of hot and cold" may also seem strange, since both are "contained in" the Boundless, but I think this sufficiently explained in the suggestion which I make in the following paragraph: hot and cold, being perfectly "blended" in the Boundless, emerge as distinct, recognizable powers only after the "separation."

¹⁴¹ *Phys.* 187a21–22.

¹⁴² This leads to at least two fundamental differences from Milesian doctrine: (1) generation, the prime category of Milesian physics, is now denied (Emp. *frag.* B8, Anaxag. *frag.* B17); (2) the opposites themselves usurp the role of the Milesian *archē*, they become "roots" and "seeds," are thus the "source" (*pēgē*) of mortal things (Emp. *frag.* B23.10), and, in Empedocles, are endowed with the divinity which the Milesians had assigned to the *archē*.

¹⁴³ Galen's commentary on Hipp. *Nature of Man* 15 (cited in DK under Emp. *frag.* A34) οὐ γὰρ ἐκ τῶν ἀντικειμένων γέγονε, ἀλλ' ἐκ τοῦ ἀπείρου [the Hippocratic doctrine] ἀλλὰ κατὰ σμικρὰ μοῖρα παρακείμενων. Empedocles was followed by the atomists: Alexander Aphrodisiensis *De mixtione* 2 (cited in Diels-Kranz under Democ. *frag.* A64).

¹⁴⁴ *frag.* 14.55–57: εὐ τε κέκρηται καὶ . . . ὅλον ἐν τε γέγονε καὶ ἀπλοῦν. Contrast this with Aristotelian usage, where *kekramenon* and *haploun* appear as contraries (*De sensu* 447a18).

¹⁴⁵ In Hippocratic terms, "no individual power is displayed" (see above, n. 12).

¹⁴⁶ With the single exception noted above; n. 136: the plural *ex hōn . . . eis taūta* in *frag.* 1.

¹⁴⁷ E.g., *Ancient Medicine* 16.35, when the Powers are "mixed and blended with one another, they are neither apparent [*phanera*] nor do they hurt anyone, but when one of them is separated

Anaximander's Boundless: no part of the compound, no matter how minute, being either hot or cold or dry or moist, etc., the whole is just what Aristotle would call "indeterminate."¹⁴⁸

On this interpretation we can explain the strictly reciprocal nature of injustice and reparation in Fragment 1. The Boundless itself, being perfectly blended, must be a state of dynamic equilibrium.¹⁴⁹ In no portion of it can any power dominate another and thus commit "injustice." Only when the world-forming segregation occurs can separate powers show up. Thereafter, wherever one of these is strong enough to encroach upon another, "injustice" will result. When the world is, in due course, reabsorbed into the Boundless, the opposites are *not* destroyed. They do *not* cease to exist. They are only blended once again, and their equilibrium is perfectly restored. And this must entail a process of "reparation," where unjust gains are disgorged and unjust losses fully made up. Thus at no time is there either injustice against the Boundless or reparation to it. Reabsorption into the Boundless is only the process which ensures full reparation among the opposites themselves; the damages are paid not to the Boundless but to *one another*.

C. Justice in the World

But what of the interval between generation and dissolution? Are we to suppose that the life-history of the world is a series of encroachments, unchecked until a judgment day at the very end? Such a supposition would go against every canon of pre-Socratic physics. If becoming were a theater of injustice without reparation, it would be not cosmos but chaos, and the elegant pattern of balanced equalities in Anaximander's world would collapse. But such a possibility is precluded by the structural elements of Anaximander's own cosmogonic process. The opposites, balanced in the Boundless, issue from it *together* in balanced proportions.¹⁵⁰ It follows that the hot in a given world

will be no stronger than the cold, and so for the other opposites. Moreover, since the world is "encompassed" by the Boundless,¹⁵¹ nothing can enter or depart to upset the balance fixed upon the opposites in the process of generation.¹⁵² Thus the Boundless "governs" the world throughout [172] its growth and decline. This is never a matter of direct action by the Boundless upon the inner structure of the world, for the whole of the cosmology is delineated in terms of the interaction of the opposites themselves upon one another. The Boundless "governs" by "encompassing,"¹⁵³ i.e., by safeguarding the original equality of the opposites with one another.

If this equality is maintained, justice is assured, for no opposite will be strong enough to dominate another. When encroachment occurs, it will be compensated by "reparation," as, e.g., in the seasonal cycle the hot prevails in the summer, only to suffer commensurate subjection to its rival in the winter. We have already met this ordered sequence of "successive supremacy" in the medical writers and Empedocles. And, although our evidence is not sufficient to establish it conclusively in the case of Anaximander, we can impute it to him with considerable likelihood.¹⁵⁴ In any case we can assume with perfect confidence that, while reabsorption into the Boundless would be the com-

¹⁴⁸ Arist. *Phys.* 203b11–13. "and it encompasses all things and governs all things, as those assert who do not recognize other causes besides the Boundless, e.g., *nous* or love." The terms of reference apply definitely, though not exclusively, to Anaximander. Cf. also Hippol. *Ref.* 1. 6.1 (Diels, *Dox. Graeci* 559 18).

¹⁴⁹ For the atomists, matter inside and outside a "world" was homogeneous, hence the *exitus intrinsecus* through the *spiracula mundi* (Lucretius 6. 492–94, cf. 1. 999–1001; 1. 1035–51, 2. 1105ff. See also Democ. *Frag.* A40 = Hippol. *Ref.* 1. 13. 4; Leucippus *Frag.* A1 = Diog. Laert. 9. 32). Similarly, Anaximenes' world could "breathe in" the outside air, which was the same stuff as the air within. For Anaximander, on the other hand, the Boundless is unassimilable, unless duly separated out, and there is no hint in our sources that this separation could occur except at the appropriate stage of world-formation. This would seem to invalidate Heidel's assumption ("On Anaximander," pp. 227–28) of cosmic respiration in Anaximander.

¹⁵⁰ And thus performs the function that Parmenides would later assign to *Dikē-Anankē*, i.e., it holds the world fast "within the bonds of the limit" (see *Parm. Frags.* B8 31, and B10 5–7, bearing in mind that *periechein* = *amphus echein*. Parmenides internalized—to Being in *Frag.* B8, to the Ouranos in *Frag.* B10—this function of "holding the limits" which Anaximander's Boundless performs by surrounding each world from the outside). But to "hold the limits (or ends) of all things" had been the divine prerogative (e.g., Semonides of Amorgus *Frag.* 1. 1–2).

¹⁵¹ Cf. So on *Frag.* 16. Diels J). Hence the point of Aristotle's reference to the *semnateōs* of the Boundless *to panta periechon* (*Phys.* 207a19; cf. the ancient tradition in *Metaph.* 1074b2 "that the divine encompasses the whole of nature"). The connection between "holding the ends" and "governing" need not be labored. But it may be worth noting that (1) boundlessness as such conveyed the idea of inescapability (e.g., Aesch. *Suppl.* 1049–50), (2) even *echein* alone could mean "to hold to the course, guide, steer" (LSJ s.v.); (3) *periechein* has also the sense "surpass, excel" and "overcome in battle" (*ibid.* s.v.).

¹⁵⁴ Heidel "On Anaximander," pp. 233–34; also "On Certain Fragments of the Pre-Socratics" (above, n. 57), 684–85. To the parallels cited by Heidel, add Philo *De incorr. mundi* 108ff., which explicitly uses the cyclical exchanges of the seasons to illustrate "reciprocation between the four powers."

off and stands by itself [see above, n. 18], then it is apparent [*phaneron*] and hurts a man" (translation adopted from Jones).

¹⁴⁸ For Aristotle determination is primarily qualitative, not quantitative; e.g., *Metaph.* 1063a28 τὸ ποῖόν ὡρισμένης φύσεως, τὸ δὲ ποσὸν τῆς ἀορίστου]

¹⁴⁹ [I say "dynamic," for the Boundless, in spite of its perfect homogeneity, is eternally in motion. Parmenides made the opposite assumption: that a perfectly homogeneous whole would have to be in a state of *static* equilibrium and, therefore, be absolutely motionless. Parmenides is followed by Plato in this: "Motion will never exist in a state of homogeneity" (*Tim.* 57e). Plato's original matrix moves because, unlike Anaximander's, being "filled with powers that were neither alike [or 'equal,' *homoiōn*] nor evenly balanced," it was *therefore* in disequilibrium. Anaximander's Boundless—ungenerated, indestructible, homogeneous, necessarily just—satisfies precisely the conditions of Parmenides' Being, except at two points: it is (1) in eternal motion and (2) unlimited.]

¹⁵⁰ Cf. Frankel, "Parmenidesstudien," p. 184 "nichts Einzelnes werdend aus dem *apeiron* heraustritt, sondern nur gemeinsam die Gegensätze."

plete and absolute end of all injustice, nevertheless overall justice is preserved throughout the life-process of the world despite the occurrence of injustice; and this by the equation of reparation to encroachment, which is itself assured through the invariant equality of the opposites.

Every student of Greek science must feel how profound was the debt of subsequent cosmology to Anaximander. His were the seminal ideas of the whirl, the infinite worlds, the unsupported earth, the conception of sun and stars as huge, free-swinging masses rather than fixtures on a copper dome. Yet more important than these and his other physical hypotheses was his philosophical concept of nature as a self-regulative equilibrium, whose order was strictly immanent, guaranteed through the fixed proportions of its main constituents. Once established, this idea becomes the common property of classical thought. It is shared by minds as diametrically opposed as Lucretius,¹⁵⁵ on the one hand, and the pious author of the *De mundo*, on the other.¹⁵⁶ In Anaximander we can trace it back to its source in the political assumption that justice was an affair between equals¹⁵⁷ and that its settlement involved an equation of compensation to injury.¹⁵⁸ [173]

¹⁵⁵ On *isonomia* in Epicurus and Lucretius, see below, p. 88 and n. 184.

¹⁵⁶ His explanation of the imperishable order of nature through the *isomoiria* and successive supremacy of the opposites comes strikingly close to Anaximander's (see citation above, n. 14; and 397b6-7). Cf. Philo (above, n. 88); Ocellus Lucanus 22: ἀντιπαθεῖς οὐσαι [sc. the four "powers"] μήτε κρατῶσιν εἰς τέλος αὐταὶ αὐτῶν μήτε κρατῶνται αὐταὶ ὑπ' αὐτῶν; Seneca, *QN* iii. 10.3: "omnium elementorum alteri recursus sunt; quicquid alteri perit, in alterum transit, et natura partes suas velut in ponderibus constitutas examinat, ne portionum aequitate turbata mundus praeponderet."

¹⁵⁷ As Heidel observes: "*dikē* obtains between peers" ("On Anaximander," p. 234).

¹⁵⁸ To "get justice" was literally to "get (back) the equal" (*isa essetai* [*Od.* 2. 203]). To "give justice" (*dikēn didonai*) was, again literally "to pay the equal" (*isēn eisen* [*Soph. OT* 810]). The underlying principle is that of an *exchange*: equal value rendered for value taken. The same words apply to the closure of a commercial transaction, like barter, sale, or loan, and to the satisfaction of justice:

ἀμείβω, ἀνταμείβομαι, ἀμοιβή, ἀνταμοιβή.
ἀλλάσσω, ανταλλάσσω ἀπόδοσις, ἀνταπόδοσις.

This pattern of thought was capable of indefinite generalization. It was popularly applied to physical sequences where one event was regularly followed by (and thus "exchanged for") its reciprocal: e.g., the cycle of birth and death (*Phaedo* 71e-72b); waking and sleeping (*Phaedo* 72b), the succession of day and night (e.g., Hesiod *Theog.* 749); the cycle of the seasons (Philo *De incorr. mundi* 109), hoofs that strike the ground in turn (Pindar *Pyth.* 4. 226); land, plowed and left fallow in turn (Pindar *Nem.* 6. 9). Scientific thought used this pattern to join events which had either been left unconnected (like evaporation and precipitation [*Arist. Meteor.* 355a28]) or else had not been clearly grasped as strict equations by the popular mind (like breathing in and breathing out [*Plato Tim.* 79e7-8]; or the stretching of a lyre string and the vibration when released [*Arist. Mech. probl.* 803a31]). But the uniformity of nature as a whole could be construed as just such a reciprocity among its basic components. Anaximander so construes it in Frag. 1.

VI. THE NATURALIZATION OF JUSTICE

When Parmenides speaks of *Dikē-Anankē* holding Being fast in the bonds of the limit, his words echo Hesiod and Semonides, who speak of fate as a "bond of unbreakable fetters";¹⁵⁹ but his thought is far from theirs. In Hesiod and Semonides, the source of the compulsion is external to the thing compelled. In Parmenides the compulsion is immanent. The first is a nonrational concept of *anankē*: the determining agency remains hidden from human reason. The second is so thoroughly rational that *anankē* merges with *dikē*, and *dikē* with logicophysical necessity: the order of nature is deducible from the intelligible properties of nature itself. We may speak of this transition, the work of Anaximander and his successors,¹⁶⁰ as the naturalization of justice. Justice is no longer inscrutable *moira*, imposed by arbitrary forces with incalculable effect. Nor is she the goddess *Dikē*, moral and rational enough, but frail and unreliable. She is now one with "the ineluctable laws of nature herself";¹⁶¹ unlike Hesiod's *Dikē*, she could no more leave the earth than the earth could leave its place in the firmament.

Thus the naturalization of justice transformed her status and added immeasurably to her stature. But it also transformed nature. These "ineluctable laws of nature," what were they prior to Milesian physics? Behind the massive stability of heaven and earth had lurked a realm of arbitrariness and terror. The uniform motions of sun and moon could be inexplicably broken by an eclipse;¹⁶² the fertility of earth and womb might mysteriously fail; children could be born "unlike those who begat them, but monsters";¹⁶³ these and a thousand other things could be thought of as lesions in natural order, special interventions of Zeus and his instruments, vindicating the authority of the

¹⁵⁹ Hesiod *Theog.* 615: ἀλλ' ὑπ' ἀνάγκης | . . . μέγας κατα δεσμός ἐρύκει. Semon. 7, 115 (Diehl): δεσμὸν ἡμφέθηκεν ἄσσηκτον πέδης]. Parm. Frag. B8 14: (οὐκ) ἀνέχε Δίκη χαλυσσάσα πέδησιν, | ἀλλ' ἔχει]. Frag. B8.31: πείρατος ἐν δεσμοῖσιν [sc. Ἀνάγκη ἔχει, τὸ μὲν ἡμφίς ἔτρυγει].

¹⁶⁰ For Solon's contribution see Werner Jaeger, "Solon's *Eunomie*," *SPAW* (Berlin, 1926, 69-85) and *Paideia*, Vol. 1, chap. 8 and also p. 158 in chap. 9. Yet the old magical conception of justice survives in Solon, side by side with the new (see my "Solonian Justice," pp. 76-78, ("J" 46-49).

Maurice Croiset in a brilliant comment on Solon Frag. 3 (Diehl): "La Morale et la cité dans les poésies de Solon," *CRAI* (Paris, 1903), p. 587.

¹⁶¹ Archil. Frag. 74 (Diehl); Pindar *Paeon* 9, 1-21. But it is worth noticing that Archilochus does not see the eclipse not as the operation of a superior type of order, obscure but unquestionable, but rather as a threat against *all* order. He identifies order implicitly with nature (even though every thing comes under the power of Zeus). His very consternation at the thought that a natural uniformity could be broken is a confession that he has lost faith in magic as a realm of order in its own right. This is a more enlightened attitude than Pindar's, whose main reaction is fear at the calamities that the eclipse may portend.

¹⁶² See Hesiod *Op.* 225-45 and parallels cited *ad loc.* in Mazon's edition; further parallels mentioned in my "Solonian Justice," pp. 9-10 (**I 33).

supernatural by suspending or reversing the ordinary course of [174] nature.¹⁶⁴ The adventurous reason of Ionian science charted this realm of magic, detached it from the personal control of supernatural beings, and integrated it into the domain of nature. All natural events, ordinary and extraordinary alike, were now united under a common law.

The equality of the constituents of this new commonwealth of nature was of the essence of the transformation, for it meant the abolition of distinctions between two grades of being—divine and mortal, lordly and subservient, noble and mean, of higher and lower honor. It was the ending of these distinctions that made nature autonomous and *therefore* completely and unexceptionably “just.” Given a society of equals, it was assumed, justice was sure to follow, for none would have the power to dominate the rest.¹⁶⁵ This assumption, as we have seen, had a strictly physical sense. It was accepted not as a political dogma but as a theorem in physical inquiry. It is, nonetheless, remarkable evidence of the confidence which the great age of Greek democracy possessed in the validity of the democratic idea—a confidence so robust that it survived translation into the first principles of cosmology and medical theory.¹⁶⁶

Of the four *physiologoi* we have studied, Heraclitus alone appears estranged from democratic politics. His interest in the current belief in equality is not so much to vindicate as to qualify and correct it. It is therefore significant that there should be no mention of equality in his physical fragments. The equalitarianism of his physics, such as it is, seems imposed upon the author as a structural necessity rather than as a conscious choice. Order he must have, and he knows of no other way of getting it than by enforcing the equal submission of all powers to the “common” law. Thus Heraclitus in his own way remains within the general framework of equalitarian physics; certainly, he makes no effort to break with that tradition. The attempt first comes with

¹⁶⁴ For the supernatural sanctions of the pre-Solonian concept of justice, see my “Solonian Justice,” pp. 65–66 [7–132–33].

¹⁶⁵ For the political import of this idea, see *On Arts, Waters, Places* 16 (also 23–30E), and cf. HJ 3–80, 3–6, 3–142, 3–5–78. The benefits of democracy are inferred here from the fact that under it men are *autonomous* (*On Arts, Waters, Places* 16–10, cf. 16–35 and 23–37). This is not merely the formal power to issue laws but the more fundamental power to order one’s own life without domination by an “alien power” (16–36).

¹⁶⁶ Professor Kurt von Fritz raises an important question (by correspondence): May not the political equivalent of cosmic equality be the idea of balance of power between classes or governing bodies (as, e.g., kings, ephors, senate, *apella* in Sparta) rather than the idea of equality between individual citizens? Only the latter, of course, would be characteristic of democracy in its mature form. The answer, it seems to me, is in the idea of “rotation of office,” which (1) applies to individual citizens rather than to classes or governing bodies; (2) is decisively democratic as a general constitutional practice; and (3) implies equality of “honor” (*timē*) or status. This, as we have seen, Empedocles explicitly asserts of the cosmic powers. There is no reason to believe that Parmenides or Anaximander thought of the powers in any other sense. On the contrary, everything we have seen of their respective cosmologies implies perfect equality of status among the basic constituents of their cosmos.

Anaxagoras’ doctrine of *nous*, which, unlike Heraclitus’ fire, is “mixed with nothing, but is alone, itself by itself,”¹⁶⁷ and has therefore absolute,¹⁶⁸ one-sided dominion over the “mixed” forces of nature. But this revolt proved abortive. It was Plato, the bitter critic of Athenian democracy, who carried through the intellectual revolution (or, more strictly, counterrevolution) to a successful conclusion; and Aristotle followed, though with hesitations and misgivings.¹⁶⁹ [175] In their systems we find at last the explicit and thoroughgoing negation of Anaximander’s equalitarian universe.

The attributes of divinity are now reserved to one set of superior entities, which alone are perfect, “prior,”¹⁷⁰ sovereign,¹⁷¹ ageless, incorruptible. Nature is no longer a single mechanical system, composed throughout of the same stuff, ordered throughout by the same laws of motion. It breaks apart into a “hither” and a “yonder.”¹⁷² The first, thinks Aristotle, consists of the familiar Ionian opposites; the other, of “something beyond the bodies that are about us on this earth, different and separate from them, the superior honour of its nature being proportionate to its distance from this world of ours.”¹⁷³ There are two types of motion, each simple and incommensurable with the other: the circular motions of the “more honorable” bodies, which are “perfect” and undeviatingly uniform; the rectilinear, “imperfect,” and “wandering” motions which occur only in the “lower” regions.¹⁷⁴ *Dikē* and *anankē*,

¹⁶⁷ Frag. B12: μέμεικται οὐδενὶ χρήματι, ἀλλὰ μόνος αὐτὸς ἐν ἑαυτοῦ ἐστίν. For the same expression in Hippocratic treatises, see above, n. 18. In medical thought the state of isolation is a sign of disorder: in Anaxagoras’ *nous* it accounts for order. There could be no more striking evidence of the clear-cut negation of Ionian categories. The Platonic Form conserves this feature of Anaxagoras’ *nous*: it is *auto kath’ hauto*, and thus *ameikton*, *katharōtaton*.

¹⁶⁸ *autokrates*, Frag. B12. Cf. Plato *Crat.*, 413c: *autokratōra gar auton ontā* (sc., *Anaxagoras nous*).

¹⁶⁹ For Plato see my “Slavery in Plato’s Thought,” *PR* 50 (1941), 289–304, Sec. 1. Herodotus had registered the conviction that “monarchy” is *unjust in principle*, i.e., irrespective of the personal merits of the incumbent; it would produce *hubris* even “in the best of all men” (3–80–3). Plato and even Aristotle, on the other hand, hold that, given a man sufficiently superior in virtue, he should be “sovereign over all” as a matter of justice (*Pol.* 1284b28ff., 1288a15ff.).

¹⁷⁰ See above, n. 39.

¹⁷¹ *kuriōs*: [Plato *Rep.* 7, 517c (of the Form of the Good); *Tim.* 90a (of the rational soul). More frequently in Aristotle] (s.v. in Bonitz, *Index Aristotelicus* [Berlin, 1870]). This is instructive, for the term conveys the nearest Greek equivalent to the modern concept of political sovereignty.

¹⁷² Note Plato’s use of *τὸνδε τὸν τοῦτον*, [ἐνταῦθα versus ἐν θεοῖς, ἐκεῖνα, ὁ τῶν κακῶν καθαρὸς τόπος (*Theaet.* 176a7–8, b1: 177a5), and Aristotle’s use of *τὰ ἐνταῦθα* (s.v. Bonitz, *Index*), *τὰ παρ’ ἡμῖν* versus *τὰ κεῖ, ἡ θειοτέρα οὐσία*].

¹⁷³ *De caelo* 269b13–17 (Stock), cf. *ibid.* 269a31–33, and *Meteor.* 339a11. Abstracting from Aristotle’s “fifth” element one finds a comparable, though weaker distinction in Plato: in the heavens the four elements are purer “nobler, etc.” than they are here (*Phil.* 29b–d, *Phaedo* 109b–110b, esp. 110a) presumably because there they are free of the six wandering motions (*Tim.* 34a). In *Laws* 12–967c (cf. x. 886d–e) the view that there are “stones or earth” in the stars is denounced as criminal atheism.

¹⁷⁴ For the effects of this bifurcation on Aristotelian dynamics, see W. D. Ross, *Aristotle’s Physics* (Oxford, 1936), p. 33. Ross points out that in *Phys.* 244a1–3 (he might have added *Meteor.* 370b20–28) there is, nonetheless, a true analysis of circular motion as the resultant of

logical reason and physical necessity, which had merged in the pre-Socratics to banish disorder from the physical universe, are now separated.¹⁷⁵ For all its teleological subordination to the "good," matter remains a residual principle of evil and disorder.¹⁷⁶

From the polemics of *Laws* 10, one would never guess that any of Plato's materialistic opponents¹⁷⁷ had believed that [176] "all human laws are nourished by the one law divine" and had thought of this justice in the nature

two inverse rectilinear motions. The history of thought offers no better example of a great thinker, hitting on a scientific explanation of revolutionary import, yet missing its significance because of the blinkers of a metaphysical dogma.

¹⁷⁵ See my "Slavery in Plato's Thought," p. 296; to the references there cited, add *Soph.* 265c: αἰτίας αὐτομάτης καὶ ἄνευ διανοίας φύσεως ἢ μετὰ λόγου etc.; and *Laws* 12.967a: ἀνάγκαις . . . οὐ διανοαίς. In Aristotle the contrast of the "good" and the "necessary" cause is analogous to the contrast of "rational" and "material" (*Phys.* 200a14: ἐν τῇ ὅλῃ τὸ ἀναγκαῖον, τὸ δ' οὐ ἐνεκα ἐν τῷ λόγῳ. *De part. anim.* 663b22–23: ἡ ἀναγκαῖα vs. ἡ κατὰ λόγον φύσις).

¹⁷⁶ See my "Disorderly Motion in the *Timaeus*," *CQ* 23 (1930), 71–83, at 80 and 82n.3 (**2.260–62, 264n 76). Hence natural science can be only a "likely tale." And even Aristotle holds categorically that there can be no science of the indeterminate (*Prior Analytics* 32b18); cf. the role of the indeterminateness of matter (*hē tēs hulēs aoristia*) in *De gen. univ.* 778a7, and cf. also *Met.* 1010a3, 1049b2.

¹⁷⁷ Plato here is intent on exposing the basic error of "all the men who have ever handled physical investigation" (891c [Bury]). He has in mind the most mature physical systems, including atomism; but he draws no fine distinctions and makes no honorable exemptions, for he is convinced that all those who sowed the materialist wind must be held responsible for the whirlwind, i.e., the conventional theory of justice. Tate (*CQ* 30 [1936], 48–54) has argued that the butt of Plato's polemic is Archelaus and his fourth-century followers. Certainly, Archelaus meets the double imputation of materialist cosmology and the conventional theory of justice and thus falls within the scope of Plato's polemic. But that a second-rate thinker should be singled out as *the* representative of materialist physics seems unlikely, and as for his "followers," we know nothing about them. I think Tate forces the meaning of "neōn kai sophōn" in 886d. Since *archaioi* here clearly refers to the theogonies (886c; cf. *Arist. Meteor.* 353a34), *neoi* can only mean the more "modern," though scarcely contemporary, cosmogonies of scientific physics (cf. *Meteor.* 353b5; and *Met.* 1091a34–1091b11: ποιῆται *archaioi* versus *husteroi sophoi*); what is contemporary for Plato is the influence of this trend of thought. Tate further restricts unnecessarily the reference of the doctrine that the heavenly bodies are "earth and stones"; this applies to Democritus (*Frag.* A39) as much as to Anaxagoras. Tate appeals to 895a to show that "Plato cannot be arguing against atomism, according to which motion is eternal and had no beginning" (p. 53); but note the force of *hoi pleisto tōn to autōn*. The frequent inveighing against "chance" and "necessity" must have Empedocles and Democritus in mind, if we may judge from the reference of similar arguments in Aristotle (for Democritus see passages in DK, *Frag.* A65–A70). And, since Empedocles was not known for his political theory (*Frag.* B135 to the contrary notwithstanding), the sequel to the materialism that "politics shares little with nature, much with art" (889d) must surely include Democritus (and his followers, whose existence is not a matter of conjecture). Plato's concession that politics, on this view, does have a "small" share with nature fits Democritus, who would insist (against the out-and-out conventionalists) that art is itself a product of material necessity and "makes" nature (*Frag.* B33; cf. Nausiphanes *Frag.* B2.18 3). Incidentally, Anaxarchus (*Frag.* A3 and A5) shows the kind of objectionable politics that could be associated (rightly or wrongly) with the Democritean school and thus lends some plausibility to the worst that Plato imputes against the wicked materialists in 890a.

of things not as impersonal order but as a "thought that steers all things through all things."¹⁷⁸ But Plato is right in accenting the difference and neglecting the agreement. His early predecessors had endowed physical nature itself with the attributes of reason, including justice and thought. They had been so absorbed in the discovery that nature was rational that they never stopped to distinguish between the categories of intelligibility and intelligence.¹⁷⁹ That distinction is foreign to archaic thought and language, as we can see from the systematic ambiguity of words like *logos*, *gnomē*, and *nous*.¹⁸⁰ In Plato and Aristotle, on the other hand, the identification of rational thought and rational thing is deliberate. It is achieved not by rationalizing material nature but by degrading matter to the realm of the irrational, the fortuitous, and the disorderly.

W.A. Heidel, who was much preoccupied by this momentous transformation, took a strangely fatalistic view of the transition: "The transfer of the functions and attributes of the ancient gods to *physis* by the philosophers of the sixth and fifth centuries eventually so charged nature with personality that the Socratic teleology was a foregone conclusion."¹⁸¹ The atomist system proves that this development was anything but a "foregone conclusion"—that the natural evolution of Pre-Socratic thought was not toward the ever-increasing personalizing of nature, but the reverse. From [his] {their} Ionian predecessors {Leucippus and} Democritus inherited the universe of homogeneous construction and immanent necessity which they had reared with the scaffolding of cosmic [177] equality and cosmic justice. The structure completed, the scaffolding could be dropped. [The order of nature is now assured through the impenetra-

¹⁷⁸ Heracl. *Frag.* B41. "Govern" connects this fragment with Anaximander (see above, n. 153). Xenophanes (*Frag.* B25) and Empedocles (*Frag.* B134) speak explicitly of a divine "mind", and Parmenides' Being was also, no doubt, conceived as mind on the principle of the identity of thought and being. Needless to say, in all this the accent falls not on spiritualizing nature but on naturalizing spirit. In Anaximander the Boundless itself has the properties of the gods (*Frag.* 3). In Heraclitus the governing mind is still plain fire (*Frag.* B64). In Xenophanes, God is described in words which Parmenides applies unchanged to his Being (cf. *Xen. Frag.* B26 ἀεὶ δ' ἐν ταυτῷ μέμνεν with *Parm. Frag.* B8.29).

¹⁷⁹ On the contrary, they made, all too confidently, the opposite assumption—that "all things have thought" (*pephronēken hapanta* [*Emp. Frag.* B103; cf. *Frag.* B110 10]). There is every reason to believe that this is the general assumption among the pre-Socratics; cf. the identification of thought with the *krasis* of the elements in Empedocles and Parmenides and of soul with fire in Heraclitus and air in Anaximenes.

¹⁸⁰ *Logos* "account," both in the active sense of accounting (*logos* as speech and/or thought) and in the objective sense of the character of things which makes them capable of being so accounted (*logos* as mathematical proportion, etc. which can be in physical objects themselves. *Leucip. Frag.* B2, πάντα ἐκ λόγου τε καὶ ὑπ' ἀνάγκης). Similarly, *gnomē* could also be used to mean not only the *cognoscens* but also (though rarely) the *cognoscendum*, e.g., the well known *kakos gnomas* in *Phaedr.* 60, where *gnomas* has exactly the same sense as the *semata* of fire and night in *Parm. Frag.* B8 55 ("Merkzeichen" [DK]). As for *nous*, Liddell and Scott cite *Hdt.* 7 162: οὗτος ὁ νόος (sense) τοῦ ὄψματος.

¹⁸¹ "Peri *Phuseōs*," *PAA* 45 (1910), 79–133, at 94–95.

bility of the atoms,¹⁸² the eternity of their motion,¹⁸³ the infinity of their number and form. Thence Democritus could have deduced "the balanced strife of the first beginnings," the equality of opposites, the equilibrium of creative and destructive forces.¹⁸⁴ These theorems appear in Epicurus under the title of *isonomia*. Democritus could have made the same deductions and claimed the same title; there is no evidence that he ever did. [The intelligible order of nature is as secure in this new system as it had ever been in the earlier ones: 'nothing happens at random, but everything from a reason and by necessity' (Leucippus Frag. B2). But no effort is now made to ground this order in *isonomia*.]

Compared to Anaximander's, the design of the Democritean universe is indifferent to equality: The infinite worlds are unequal in size and power and at unequal intervals from one another.¹⁸⁵ Earth, sun, moon, and stars are also, no doubt, unequal in size and at unequal intervals.¹⁸⁶ As for the earth, its breadth and length are unequal,¹⁸⁷ and the northern and southern halves of the cylindroid are unequal in weight.¹⁸⁸ Cosmic equality has lost its importance, for cosmic justice no longer makes sense. Justice is now a human device; it applies solely to the acts and relations of conscious beings. It is not arbitrary, for it is rooted in the necessities of man's nature and environment. But neither does man find it in the universe as such; it is a product of civilization and art.¹⁸⁹ Justice is only the form which the immanent order of nature achieves in the mind and works of man. Justice is natural, but nature is not just.

¹⁸² [See Lucr. 1, 485–86 and 592–98, where the uniformity of nature is derived from *antitopia*]

¹⁸³ [For the conservation of motion, see Lucr. 1, 294–307 (cf. Epic. Ep. ad Hdt. 1, 39, and the ultimate source in Parm. Frag. B8.7).]

¹⁸⁴ [We do meet this principle once again in Epicurean atomism:] Cicero ND 1, 19, 50; { . . . ut omnia omnibus paribus paria respondeant. Hunc *isonomiam* appellat Epicurus, id est aequabilem tributionem } Cf. also the {notion of} successive supremacy [of opposing forces in nature] in Lucretius 2, 567–76, "nunc hic nunc illic superant . . . et superantur item."

¹⁸⁵ Hippol. Ref. 1, 13, 2 and 3 (Democ. Frag. A40). Hence the destructive collisions between worlds, "the greater overcoming the lesser (Aët. 2, 4, 9 = Frag. A84). Moreover, the worlds are dissimilar in contents: "in some there is no sun nor moon, in others larger ones than ours, in still others more [than one sun and moon] . . . and there are worlds devoid of animals, plants, and all moisture" (Hippol. loc. cit.).

¹⁸⁶ The first I infer from (1) the general gravitational theory, which entails that the largest bodies are sifted toward the center and (2) the fact that sun and moon were originally composed of a substance that "resembled the earth" (Plut., Strom. 7 = Frag. A39). As for the intervals, the only definite statement is Hippol. Ref. 1, 13, 4 = Frag. A40: "neither is the height of the planets equal"; but even this would be enough to spoil the symmetry of Anaximander's scheme

¹⁸⁷ Frag. B15 (Agathemerus 1, 1, 2); Frag. A94 (Eustathius, schol. to Il. 7, 446)

¹⁸⁸ The south being more temperate, "the earth is weighed down in that direction, where it has an excess of produce and growth" (Frag. A96 = Aët. 3, 12, 2).

¹⁸⁹ See Frags. B172–73: "good" and "evil" are not in nature as such, but in what man does with nature through the power of his art and its "teaching." For the application of this principle to the origin of human civilization, see Democ. Frag. B5. The validity of this material as a source of Democritean ideas has been disputed, but see my "On the Prehistory in Diodorus," *AJP* 67 (1946), 51–59 (**1351–58).

ISONOMIA

THAT *Isonomia* preceded *Dēmokratia* as the common name for popular government is reasonably clear from the Debate on Constitutions in Herodotus, III, 80ff.¹ The form of government here named *Isonomia* is "the rule of the masses"² in contrast to both tyranny and oligarchy; it is identified in the most positive way by the characteristic devices of the democratic constitution: election by lot, the audit of public officials, the power of the assembly to discuss and decide all questions of public policy.³ The omission of the word *Dēmokratia* in this context can hardly be accidental. For the debate goes on for several paragraphs, and if Herodotus, or his source,⁴ had known the word at this time, we would expect some use of it⁵ such as we

From *AJP* 74 (1953): 337–66. Reprinted by permission. Minor changes to spelling and punctuation have been made.

¹ The same conclusion from this text is reached by J.A.O. Larsen, "Cleisthenes and the Development of the Theory of Democracy at Athens," in *Essays in Political Theory presented to G. H. Savane* (Ithaca, 1948), pp. 1ff. My great debt to this paper will be evident from the sequel, though I cannot agree with it in every detail. See also Debrunner, "Demokratia," in *Festschrift für E. T. He* (Bern, 1947), pp. 11ff.

² 3, 80, 6, πλήθος ἄρχων [δημος κρατέων], cf. 81, 1, ἐς τὸ πλῆθος . . . φέρειν τὸ κράτος.

³ 3, 80, 6.

⁴ I concede the possibility that Herodotus was drawing on an earlier source (cf. Larsen, "Cleisthenes," p. 4) but attach no particular importance to it. If true, this would obviously strengthen my argument as to the early currency of *Isonomia* as a name for democracy.

⁵ And not only in the speeches, but also in the narrative sequel at 3, 83, 1, where *Isonomia* has an ornamental function but simply serves as the writer's name for the form of government espoused by Otanes. I might add that I believe (with LSJ) that *dēmos* may mean the democratic form of government, and (with J. E. Powell, *A Lexicon to Herodotus* (Cambridge, 1938)) that instances of this sense occur in this debate. Larsen ("Cleisthenes," p. 6n.16) argues that at 81, 3; 82, 1; 82, 5 *dēmos* means "the people as the ruling body" and, therefore, cannot mean this form of government. That this disjunction is inadmissible seems to me clear from the use of *katalusis tou dēmon* as equivalent to *katalusis tēs dēmokratias* in official texts. *Epī katalusēi tou dēmon* occurs in the Bouleutic Oath (*apud* Demosth. 24, 144), introduced "five years after this [the Cleisthenean] order" (Aristotle, *Ath. Pol.* 22, 2), probably in 501/0 (von Fritz and Kapp, *ad loc.*, in their translation with notes of this work [New York, 1950]). *Per contra*, the law ("of Solon," but obviously liberally redrafted) enacted in 410 reads ἐάν τις τὴν δημοκρατίαν καταλύῃ (*apud* Andoc. 1, 96). I suggest that in this Debate Herodotus is in the position of the drafters of the early democratic legislation, who had to use the concrete *dēmos* for the idea which would be more formally expressed by *Dēmokratia*, once the latter became current. Herodotus generally uses

[337] find in later portions of the *History* of Herodotus.⁶ The only ground on which this argument could be overruled would be some evidence that *Dēmokratia* was already in common use by the time of Herodotus' Debate on Constitutions or that of his source. This Ehrenberg thinks he can supply from the *Suppliants* of Aeschylus.⁷ His splendid analysis of this neglected source of democratic ideology certainly establishes the fact that the *idea* expressed by *Dēmokratia* was perfectly clear to Aeschylus and his audience; it is exactly rendered in such phrases as "the people who rule the state" (τὸ δάμιον τὸ πτόλιν κρατύνει) and "the people's ruling hand" (δήμου κρατούσα χεὶρ) which, as Ehrenberg illuminatingly puts it, can mean nothing else but "ὁ δῆμος κρατῶν τῇ χειροτονίᾳ, that is to say, that the show of hands is the expression of the people's rule, of *Dēmokratia*."⁸ [338] But it is one thing to have a phrase for an idea, quite another to have a word which compresses the whole phrase into a single, abstract noun that stands as the proper name of democracy; the evidence which is quite enough to establish the former could hardly justify Ehrenberg's inference that "it is almost certain" that the word *Dēmokratia* was "not unknown" to Aeschylus at this time.

Now the words *isonomous*, *Isonomia* occur respectively in two well-known texts, both earlier than the Debate in Herodotus or its source: the Song of Harmodius⁹ and Alcmaeon, fragment 4.¹⁰ Unfortunately, the political meaning of the word which is so gloriously plain in Herodotus is by no means explicit in these texts and must be reconstructed. Here we surely may proceed by extrapolation from Herodotus, for it is extremely unlikely that a word which proclaims democracy so belligerently in Herodotus could be telling a radically different story a few years, or, at the most, decades earlier. What then shall we make of Ehrenberg's view that in both of these early texts *Isonomia* is an "aristocratic conception" and means the "equality of noblemen, as contrasted with lack of equality expressed in the rule of one man"?¹¹

The gravest objection to this view is stated by Ehrenberg himself when he remarks that "it remains [on his theory] something of a puzzle how the aristo-

cratic *Isonomia* could so quickly become the watchword of democracy."¹² Only definite evidence to the [339] contrary could overrule its antecedent improbability. But an examination of the texts yields no such evidence whatever

Consider the first quatrain in our surviving text of the "Song of Harmodius":

In a myrtle bough I'll carry my sword,
Like Harmodius and Aristogiton,
When they slew the tyrant
And made Athens *isonomous*.

What could be the meaning of *isonomous* here? Let us canvass all the possibilities. Is it being used as

- (i) a neutral term which simply means liberation from tyrannic rule, without any positive specification of the sort of government that followed; or
- (ii) a term which does describe the ensuing regime but thinks of it only as the reinstatement of the pre-Peisistratid constitution; or finally
- (iii) a term which celebrates the new Cleisthenean order?

Now (i) is so unlikely that no one has sponsored it, to my knowledge. A word so rich in meaning could hardly be just a colorless variant for *eleutherous*.^{12a} But if this were its actual sense here, it would offer no positive ground for taking this to be "equality of noblemen," since on this hypothesis it means no more than liberation from tyranny. (ii) I think no less unlikely,¹³ for

¹ OD, *loc. cit.* The solution he offers for this "puzzle" is that Cleisthenes used to his own radically different purpose "the ideas and the slogans which had dominated the actual liberation" (p. 534). This surely begs the real problem. If *Isonomia* had meant only a year or two before "equality of noblemen" it would be fantastically inept to express the spirit of a new order whose immediate enemies were precisely those who did believe in "equality of noblemen" and whose basic innovations were designed to break the power of the nobles. No amount of cleverness in the art of pouring new wine into old vessels could overcome this flagrant contradiction. To explain the difficulty, Ehrenberg would have to argue that Cleisthenes was trying to conciliate the nobles, which Ehrenberg rightly denies; and if, *per impossible*, this had been his real aim, he would have reverted to the Solonian *Eunomia*, which, however inadequate to express the spirit of his own constitution, would still be immeasurably closer to it than "equality of noblemen."

^{12a} Larsen ("Cleisthenes," pp. 6-10) stresses the opposition to tyranny both in this and other contexts; but I do not understand him to mean that either in the *skolion* or any other important text *Isonomia* is merely the contradictory of tyranny.

¹³ Contra, F. Jacoby, whose view I shall consider directly. Ehrenberg's own view would have to come under this heading, for it assumes that the *skolion* was composed "in the years after 514" when "there was no difference of aims between the Alcmaeonids and the other nobles" (OD, p. 531). Now 514 will not do as the *terminus post quem*, the *skolion* envisages the liberation of Athens as an accomplished fact and could only have been composed after the expulsion of Hippias at 510, thus forcing Ehrenberg to narrow its dating to the years between 510 and 508. But is there any reason to think of those years as a political honeymoon between Cleisthenes and Isagoras, with "no difference of aims" between them other than opposition to tyranny? As Ehrenberg

mounarchiē (or *urannis*) as the name of monarchy; but at least once (82, 1) he makes the concrete *mounarchas* express the abstract idea, paralleling the usage of *dēmos* for *Dēmokratia*.

⁶ *Dēmokrateesthai*, *dēmokratias* at 6, 43, 3; *dēmokranēn* at 6, 131, 1. For the earlier date of the "Persian History," see especially J. E. Powell, *The History of Herodotus* (Cambridge, 1939).

⁷ "Origins of Democracy," *Historia* 1 (1950, pp. 515ff. (I shall refer hereafter to this paper by the abbreviation "OD"). My debt to all of Ehrenberg's work is very great and no less so at the very points where, as will appear, I have disagreed with him; the ideas expressed throughout this paper have been sharpened by his careful and imaginative analysis of the evidence.

⁸ OD, p. 522.

⁹ *Scolia anonyma*, nos. 10 and 13 in Diehl 2, pp. 184ff.

¹⁰ DK^a. All subsequent citations of Presocratic fragments refer to this work.

¹¹ *Aspects of the Ancient World* (Oxford, 1946), p. 89. See also his article "*Isonomia*," in *RE*, Suppl. 7, cols. 293ff.

we have not a scrap of evidence that the pre-Peisistratid [340] order was termed *Isonomia*. As Ehrenberg himself has stressed, Solon's own word for the general spirit of his reforms was not *Isonomia*, but *Eunomia*;¹⁴ one would therefore expect that only a radical departure from the Solonian constitution would prompt the use of the new word. But even if we suppose that (ii) is right, "equality of noblemen" would still be utterly inept as a description of the pre-Peisistratid *status quo*. The Solonian order, where civic rights were apportioned in accordance with income in brutal disregard of birth, could scarcely be thought of as "equality of noblemen"; still less could the modification which followed the deposing of Damasias, where the eupatrids were limited by law to five archonships, three and two others being reserved for non-eupatrid landowners and artisans respectively.¹⁵

(iii) is by all odds the most likely hypothesis. The use of *Isonomia*, trivial on the first hypothesis, unaccountable on the second, is not only accountable but profoundly significant as the expression of the spirit of the Cleisthenean reforms, whose combined effect had been, in Aristotle's phrase, to "give the state to the masses."¹⁶ The only serious objection I can think of to this view would issue from Jacoby's assumption that the *skolion* expresses an anti-Cleisthenean sentiment. But this assumption [341] strikes me as wholly gratuitous.¹⁷ The *skolion's* statement that Harmodius and Aristogeiton "made

himself remarks (p. 540). Cleisthenes must have had a political program and made it "widely known" before the second intervention by Cleomenes, else the popular party would not have recalled him and turned to him as its natural leader when it defeated Cleomenes and ousted Isagoras. Is it reasonable to think of so radical a program as a last-minute concoction, rather than the final expression of a longstanding opposition between the general orientation of Cleisthenes and Isagoras, the friend of Sparta? Even apart from this objection, Ehrenberg's case ties him down to an excessively narrow dating of the *skolion*, for which I cannot conceive any argument other than that this date, and this alone, could support the sense of "equality of noblemen" for *isonomous*, which, of course, is arguing in a circle. The reference of the *skolion* to Hipparchus as "the tyrant" argues for a later date than the years immediately following the time when Hipparchus was the real tyrant and the decisive struggle had to be fought against him.

¹⁴ OD, pp. 534–35; cf. *Aspects of the Ancient World*, pp. 84–85.

¹⁵ Arist. *Ath. Pol.* 13, 2.

¹⁶ Ibid., 20, 1. For Cleisthenes as the real founder of Athenian democracy, see both Larsen, "Cleisthenes," and Ehrenberg in OD.

¹⁷ I say this with profound respect for the greatest living master of Greek historiography. But after going through the lengthy and vigorous exposition of his view (*Athis* [Oxford, 1949], pp. 158ff. and notes, especially notes 52–54 at pp. 339–40), I find only two definite arguments for the view that the *skolion* is anti-Alcmaeonid: that it ascribes the ending of the Peisistratid tyranny (i) not to the Alcmaeonids but to Harmodius and Aristogeiton who (ii) "belonged to one of the great clans . . . , with which Cleisthenes fell out immediately after the expulsion of Hipparchus" (p. 339n.53). (i) I proceed to discuss directly in the text above and in the following note. In the case of (ii) no evidence is offered to support the "falling out" of Cleisthenes with the Gephyraioi; Herodotus 5, 72, 1 (followed by Arist. *Ath. pol.* 20, 3) gives seven hundred (noble) families on the side of Cleisthenes, three hundred on that of Isagoras; how does Jacoby know that the Gephyraioi were with the minority led by Isagoras, who had been "a friend of the tyrants" (Arist. *ibid.*, and cf. B. D. Meritt, "Greek Inscriptions," *Hesperia* 8 [1939], pp. 48–82, at p. 62)?

Athens *isonomous*" surely cannot be pressed to mean "they, and not the Alcmaeonids, made Athens *isonomous*." This is a drinking-song, not a codicil in a legal document, nor the verdict of a historian.¹⁸ I can see no reason at all why the partisans of Cleisthenes should not glorify the tyrannicides in just these words (and also sponsor their heroization) without prejudicing in the least the Alcmaeonid services in "making Athens *isonomous*."¹⁹ Nor need we [342] suppose that this tribute to the tyrannicides was without practical political use. None of the many discussions of this topic has taken account of its possible connection with a fact that we know from Aristotle: that after Isagoras and his friends had been expelled and the new constitution had been promulgated, the kin of the exiled Hipparchus, Hipparchus, son of Charmus (archon at 496/5), was strong enough in Athens to present a grave threat to the new regime, and that Cleisthenes created the ostracism to get rid of him.²⁰ In such a conflict as this, the Alcmaeonids would have every reason to work the story of the tyrannicides for all it was worth, and this may well have been both the time of the heroization and the date of the composition of the *skolion*, whose words are not retrospective in tone but voice a fighting mood directed

¹⁸ Though to those who took it as history—a later generation that had no firsthand knowledge of what had happened—it *could* be misreading, and Herodotus may have had just this *skolion* (along with other vehicles of the legend) in mind when he wrote more than two generations after the event, "in my judgment it was they [the Alcmaeonids], much more than Harmodius and Aristogeiton, who liberated Athens" (6, 123). Those who had lived through the liberation would not have needed this correction. As for Thucydides, his correction of the legend (1, 20, 2; 6, 54ff.) is greatly exercised over the eclipse of the real tyrant, Hipparchus. But it does not seem intent on vindicating the Alcmaeonid contribution, which it would surely have been if (as Jacoby holds, pp. 55ff.) so momentous a historical fact had been suppressed in an "official" version in Hellas; had this been the case, Thucydides would surely have given more effort to putting the facts straight than the casual phrase that Hipparchus was "deposed in the fourth year [after the murder of Hipparchus] by the Spartans and the Alcmaeonid exiles" (6, 59, 4; cf. 6, 53, 3, where the Alcmaeonids are not mentioned at all, and the Spartans seem to be the only liberators).

¹⁹ Bowra (*Greek Lyric Poetry* [Oxford, 1936], pp. 413ff.) seems to me to make the same mistake as Jacoby in his interpretation of the *skolion*, though his conclusion is the very opposite of Jacoby's: "They [the Alcmaeonids] justified themselves [sic] against the charge of collaborating with Sparta in the struggle against Hipparchus] by falsifying history. They put it about the real destroyers of tyranny were not the Spartans, nor even the Alcmaeonids, but a pair of blameless young heroes," etc. (p. 415). I submit that (a) the "not . . . nor" clauses in the last sentence have no support in the text, and (b) even if the *skolion* were meant to "falsify" history, it could not fool the generation that had witnessed the actual events. To meet (b), Bowra would have to date the *skolion* much later than he seems willing to do. Certainly the Alcmaeonids would feel much better about sharing the credit for the liberation with the Athenian tyrannicides than with the Spartan army—the less said about Cleomenes in this connection, the better it would be for them, but this is quite another matter from saying that in this *skolion* they are "falsifying history."

Ath. Pol. 22, 3–4, which would be further strengthened if, as Meritt has argued ((above, n. 17), p. 63), Hipparchus' son, the younger Peisistratus, remained in Athens; an ostrakon bearing his name has been found in the excavations of the Agora, and Meritt is inclined to assign his archonship "to one of the available years between 499 and 497." But see, *contra*, A. W. Gomme, "Athenian Notes," *AJP* 65 (1944), pp. 321–39, here 327–28.

against a present enemy.²¹ The [343] people who composed and sang these words were doubtless noblemen; but if these noblemen were Cleisthenean partisans, the last thing they could possibly mean by *Isonomia* under such circumstances is "equality of noblemen." It could not have become the favorite song of the radical democrats²² unless its *Isonomia* was precisely the slogan of the equalitarian democracy which was founded by Cleisthenes and was realized in ever-increasing measure throughout the fifth century.

Nor does Alcmaeon's fragment offer the slightest aid and comfort to the "aristocratic" conception of *Isonomia*. Ehrenberg²³—and he is not the only one²⁴—calls him "the Pythagorean physician." Now as Heidel has pointed out, in what is by far the best extant refutation of the "Pythagoreanism" of Alcmaeon,²⁵ the only thing worthy of the name of evidence on [344] which

²¹ Raubitschek's recent argument (*AJA* 55 [1951], pp. 221ff.) that the ostracism was instituted by Cleisthenes in the same year (487) in which it was first used to expel Hipparchus, son of Charmus, fits exactly the words of Androtion (frag. 6, Jacoby) and is perfectly consistent with the wording of *Ath. pol.* 22, 3–4—the only two texts we have to go by. It fits in with his earlier suggestion that 488 is the *terminus post quem* of the erection of the statue of the tyrannicides by Antenor (*AJA* 44 [1940], p. 58n.2, with references to earlier sponsors of this date and also to other studies which reject it; to the latter K. Schefold, *Museum Helveticum* 3 [1946], pp. 59ff. should now be added) If Raubitschek's argument is accepted, it would suggest (on the above theory) a dating for the *skolon* which fully accounts for the feature I mentioned above, n. 13 *sub fin*. However, the suggestion I make above is obviously not tied to Raubitschek's theories. An earlier date for the enactment of ostracism—say, the year of Hipparchus' archonship (496), which, since the archonship was still elective (*Ath. pol.* 22, 5), must have marked a high tide of his influence—would do almost as well. On no account could I accept Carcopino's view (*Les Origines de l'ostracisme* [Paris, 1935], p. 23) that the ostracism was enacted in 507 on the sole ground that "la constitution de Clisthène forme un tout indivisible", it would surely be more than three years from the expulsion of Hippias before his Athenian kinsman could live down the Peisistratid disgrace and begin to recoup his political fortune.

²² Cf. Aristoph. *Wasps* 1225.

²³ *OD*, p. 535. Cf. Larsen, "Cleisthenes," p. 9, who speaks of Alcmaeon as "a Pythagorean from Croton."

²⁴ Zeller's is typical of the earlier view. He includes Alcmaeon in his chapter on "The Pythagoreans," though his examination of Alcmaeon's doctrine leads only to the conclusion that Alcmaeon was "considerably influenced by the Pythagorean philosophy, without having actually adopted it in its totality." *History of Greek Philosophy*, I (Eng. tr., London, 1881), p. 562. Recent writers are more guarded. K. Freeman, *Companion to the Pre-Socratics* (Oxford, 1946), p. 135: "Alcmaeon may or may not have been a Pythagorean."

²⁵ "The Pythagoreans and Greek Mathematics," *AJP* 61 (1940), pp. 1ff. But Heidel weakened his case unnecessarily by swallowing Burnet's assumption (*Early Greek Philosophy* [4th ed., 1930], p. 194) that "Alcmaeon dedicated his treatise" to the Pythagoreans Brotinus, Leon, Bathyllus (*iade elexe* . . . *Brotinōi* etc.). There is really no reason for this view. We have no parallels for dedications in this period. A discourse which takes the form of personal address, as of Empedocles to Pausanias, conveys exhortation or instruction and does not imply agreement with the views previously held by the addressee. In this case Alcmaeon is surely *opposing* the Pythagorean faith, for he starts off by declaring that (only) the gods can attain *saphēneia* about *ta aphanēa*, the very things which figured prominently in Pythagorean theology and cosmology, and goes on to limit inquiry to things determinable by means of evidential inference, *tekmarēsthai*,

such a characterization could rest is Aristotle's statement²⁶ that he *may* have derived his doctrine of opposites from the Pythagoreans. The only reason offered by Aristotle for this possibility is that "he expressed himself similarly to them." But when we compare Alcmaeon's opposites as listed by Aristotle himself in this passage (and also with those listed by Aëtius at B4), we find that the two pairs which, on any view (including Aristotle's own), are *characteristic* of Pythagoreanism—the *Peras-Apeiron*, Odd-Even contrasts—are conspicuously missing and are indeed utterly alien to Alcmaeon's thought according to all our other information about it.²⁷ Moreover, the Pythagorean concept of *Harmonia* is as different from Alcmaeon's concept of *Isonomia* (in B4) as from the general, Ionian, view from which Alcmaeon's is doubtless derived.²⁸ The general view of harmonious order in pre-Socratic cosmology and Hippocratic medicine is that of equality, i.e., the 1/1 ratio.²⁹ But the Pythagorean discoveries of the concordant intervals in music led them to quite different ratios expressive of *Harmonia*: the 2/1, 3/2, 4/3 ratios, each of them pairs of unequal numbers and thus obviously contrary to the pattern of *Isonomia*. At the same time, Pythagoreanism was a deeply dualistic worldview in a sense which is without parallel in Alcmaeon or any other of the *physiologoi* or medical writers.³⁰ The basic Pythagorean opposites, *Peras-Apeiron*, Odd-Even, are designated Good and Evil principles [345] respectively; whence it would follow that the *normal* pattern of good order which this philosophy would inspire would not be equality of the Good to the Evil principles, but the preponderance of the Good over the Evil. We simply do not know enough about their system to be able to say just how these two ideas—the inequality involved in musical harmonies and that required by the moral dualism of their metaphysics—would be merged in theory and applied to politics.³¹ But what we do know is enough to show the opposition of the general lines of Pythagorean thought to Alcmaeon's pattern of *Isonomia*, so that we have no right, without positive evidence to the contrary, to tar Alcmaeon with the Pythag-

which expresses a very different temper of mind from that which would accept all kinds of mystical doctrines on the strength of the *autoz epha* of Pythagoras.

²⁶ *Metaph.* 986a26ff. For the correct reading see Ross, *ad loc.*, and Heidel, (above, n. 25), pp. 4–5.

²⁷ I have made this point and the one immediately following in a different connection in a review of Raven's *Pythagoreans and Eleatics*, *Gnomon* 25 (1953), pp. 29ff. (*1.181ff.)

²⁸ See Section III. below, pp. 108–10.

(+ my "Equality and Justice in Early Greek Cosmologies," *CP* 42 (1947), pp. 156ff. 58ff.)

Cf. my remarks in ("Theology and Philosophy in Early Greek Thought,") *PQ* 2 (1952), at pp. 110ff. and nn. (*1.18ff. and nn.).

³¹ The most plausible guess is that it would favor some sort of hierarchic political order, a rule by the "wise" whose understanding of *Peras* confers on them unilateral authority to govern the state (Cf. E. L. Minar, *Early Pythagorean Politics* [Baltimore, 1942], pp. 98ff.) This is not inconsistent with the acceptance of equality in the form of the *talio* in corrective justice (Arist. *É. N.* 1132b21ff.).

orean brush. If we had found the Pythagoreans themselves using the term *Isonomia*, we might concede for it the sense of "equality of noblemen," though we would then have to break our heads over the question whether what little we know, or think we know, of Pythagorean politics is aptly expressed by such a sense.³² Fortunately, we need not agonize over this problem in the present argument. All we have on our hands is a text which in no proper sense is "Pythagorean" either in authorship [346] or derivation; its true affinities are with Ionian medicine and *physiologia*; and if we are to regard it, as I believe we should, as a generalization from politics, we must look for the political model which inspired it not in the Pythagorean movement, but in the general advance of democracy throughout the Greek world, especially in Ionia where, I believe, the generalization first arose. Further discussion of this latter point must await the third section of this paper

II

I do not wish to dwell longer on the historical priority of *Isonomia* as the name of democracy, important as this is in its own context. It is the meaning of the word which I shall seek to ascertain in the remainder of this essay. For while *Dēmokratia* does no more than describe a fact, *Isonomia* expresses an idea, indeed a whole set of ideas, by which the partisans of democracy justified the rule of the people. These ideas were so appealing in themselves, and so appealingly expressed by *Isonomia*, that well before the fifth century had run its course the word was being borrowed by the proponents of alternative forms of government. The Thebans in a well-known passage in Thucydides³³ speak of their own political order as *Oligarchia isonomos*. Even Plato in the Seventh Letter speaks ingratiatingly of his own ideal as that of a "just and *isnomos*

³² For various views see Minar, *Early Pythagorean Politics*, G. Thomson, *Aeschylus and Athens* (London, 1941), pp. 210ff., K. von Fritz, *Pythagorean Politics in Southern Italy* (New York, 1940), Ch. 5; A. Delatte, *Essai sur la politique pythagoricienne* (Liege, 1922). I agree with Minar that in its origins and throughout the fifth century Pythagoreanism was generally anti-democratic. But I believe he is wrong in thinking of them as proponents of "an aristocracy of the landed nobles" (*Early Pythagorean Politics*, p. 111); as I have remarked elsewhere (Review of A. D. Winspear, *The Genesis of Plato's Thought*), *PR* 51 [1942], p. 423), at the time when Pythagoreanism was a political innovation, its "intellectual aristocracy must have appeared as a challenge to the *ancien régime* of hereditary aristocracy." But this does not exclude in the least an eventual Pythagorean alliance with the conservatives against the popular forces, which seems to be implied by the most reliable of all our historical texts on this topic, that of Polyb. 2, 39, 1-4: the burning down of the Pythagorean *sunhedria* must have been a popular revolt since it led to the "destruction of the leading men of each city." This, in turn, does not preclude a later accommodation to democracy on the part of some Pythagoreans, as of Archytas at Tarentum. On all this see especially von Fritz, *Pythagorean Politics*, pp. 97ff.

³³ 3, 62, 3; to be discussed in Section III, below.

constitution."³⁴ What values lent such splendor to the word that even rivals and critics of democracy were eager to poach on enemy territory and use for their own purposes a word which continued to take pride of place in the vocabulary of the partisans of democracy?³⁵

Let us begin with the second word in the compound. Does it mean "distribution" (deriving *-nomia* from *nemein*, "to distribute") or "law" (taking *-nomia* as a derivative of *nomos* with the [347] sense of "law")? Ehrenberg has argued for the former,³⁶ and his arguments suffice to show that among the many associations of *Isonomia* in fifth- and fourth-century usage, that of *isa nemein* would be one and, at times, might even be the dominant sense in the speaker's mind.³⁷ Now "equal distribution" fits perfectly the deeply rooted notion of the democratic state as a common pool of rights and privileges equally shared by all its citizens.³⁸ Nevertheless, I do not believe this is the primary meaning of *Isonomia* as generally understood—i.e., the one which most people would take as the literal sense of the word, rather than one of its implications and allusions. Its proper meaning, I believe, is definitely *not* equality of distribution but equality of law; and this for the following reason.

In the parallel compounds, *anomia*, *eunomia*, *autonomia*, the derivation of *-nomia* from *nemein* is either impossible or unlikely. It is flatly impossible in the case of *anomia* which, as Heinemann has reminded us,³⁹ already occurs in

³⁴ *Ep.* 7, 326d; and cf. *Menex.* 239a, and see below, n.78. Plato's willingness to appropriate the word in the Seventh Letter is all the more remarkable in view of the scorn he had heaped on *isonomikos*, *Isonomia* many years earlier (*Rep.* 8.561e, 563b) in his wholesale attack on democratic ideas and institutions.

³⁵ *Isonomia politikē* is the *onoma euprepes* par excellence among the democratic leaders, Thuc. 3, 82, 8. *Isonomia* has a similar, though less striking, function in Isocr. *Areop.* 20; also Aeschines 1, 5, with n. 70, below.

In his *RE* article, cited above, n. 11, He seems to surrender the view in *Aspects of the Ancient World*, p. 75. Larsen ("Cleisthenes," p. 5n. 13) remarks that *nomos* "is derived from a root meaning 'to distribute or divide,'" but the question is whether it is formed directly from some noun with this primary meaning or from the latter noun *nomos* meaning "law," and refers to Ehrenberg's *RE* article. I hope that my discussion will be a decisive answer to this question. The earlier view had favored the derivation from *nemein*: R. Hirzel, *Themis* (Leipzig, 1907), pp. 243ff., widely followed as, e.g., by G. Busolt, *Griechische Staatskunde* I (3rd ed., Munich, 1920), p. 418.

³⁶ At col. 293 of his *RE* article, he collects the passages in which *isa nemein* occurs, some of them in direct association with the idea of democracy, and also *isōn tuchanēin* or *isa echēin* (the direct result of *isa nemein*).

³⁷ See, e.g., statements to this effect by the opponents or critics of democracy, ps.-Xen. *Ath. Pol.* 1, 2, Plato *Rep.* 557a, Arist. *Pol.* 1275a22-23 with b6, *et passim*, and by pro-democratic sources, Lys. 25, 3; Demosth. 21, 67; 24, 59; and 51, 11. Most striking is the expression employed by Herodotus (3, 80, 2 and 3, 142, 3) for the institution of *Isonomia*, that of making power "common" (*es meson katathēnai* or *tithēnai*), the same expression used by Aristophanes in the *Ecclesiazusae* (602) for the communizing of property.

³⁸ *Nomos und Physis* (Schweizerische Beiträge zur Altertumswissenschaft, Heft 1 [Basel, 1945]), p. 64, to whose discussion of *nomos* in archaic thought, pp. 61ff., I am greatly indebted.

adjectival form in Hesiod (*Th.* 307). The Titan, Typhon, is "terrible, outrageous (*hubristen*), and lawless (*anomon*).⁴⁰ In *anomos* here *-nomos* could only refer to [348] law, though, to be sure, the law in question here would not be positive, written law. Ehrenberg has rightly stressed the point that *nomos* did not acquire the sense of positive law before the sixth century.⁴¹ The earliest sense of the word is that which survives in the *Agraphos nomos* of the classical period; it is that of custom, usage, employed, of course, not merely as a descriptive term, but also (and always so in moral contexts) as a vehicle of the strongest normative import, to denote that divinely sanctioned order whose observance is of the essence of justice.⁴² The [349] (substantival) opposite to *anomos* in the epic is *eunomia*, as we see from the earliest instance of this latter compound at *Od.* 17, 487: "the gods in the guise of strangers . . . visit the cities, observing the *hubris* and the *eunomiē* of man." *Eunomiē* cannot

⁴⁰ *Aspects of the Ancient World*, p. 75. His own statement of the point goes too far: "It is beyond doubt that *nomos* did not gain the meaning of 'law' before the end of the sixth century." (For a similar view as now "generally recognized," see Heinemann, *Nomos und Physis*, p. 72.) By "law" here Ehrenberg understands the "unity of traditional and enacted standards" (p. 91) and, since *nomos* always had the sense of "traditional" standards, the question is whether it was not stretched to include positive enactment till the end of the sixth century. Such a late date seems to me inadmissible, since as soon as written law was introduced, i.e., by the end of the seventh century, the general use of *Dikē* would include the observance of written, along with that of unwritten, law, and *Nomos*, as the rule whose observance constitutes *Dikē*, would be correspondingly enlarged. This is exactly what happened to *Thesmos*: originally "traditional usage" (*Od.* 23, 296, *lektrolo palaion thesmon*), it is used as the name of Draco's law (*I.G.* 1², 61) and by Solon, frag. 24, 18, Diehl, for his own written enactments. Theognis, 54, saying of the new masters of Megara that they formerly "knew neither *dikas* nor *nomous*" (echoing *Od.* 9, 215 [so Heinemann, p. 62n.13]), with the significant substitution of *nomous* for *themistias*), is surely using *Nomos* in just this enlarged sense; the laws which these new men did not know, since "they ranged like deer outside the *Polis*," are the laws of the *Polis* which by this time (middle of 6th century) would certainly include written laws. The disputed text of Solon, frag. 24, 16, Diehl (*nomou* of Diehl's first edition versus *homou* of the second, favored by Ehrenberg and many others) cannot, of course, be used as an argument against my view. On my view *nomou* would be possible and would make a better reading, since *κράτει νόμου* . . . ἐρεῖται matches beautifully βίην τε καὶ δίκην συναμύσσει (both clauses presenting the junction of similar opposites, *kratos/bia* and *nomos/dikē*); and the idea of *nomos dikē* in these lines would match that of *thesmos/dikē* in the next two verses.

⁴¹ In this respect *Nomos* is strictly parallel to *Dikē* and *Themis*: all three may denote no more than a uniformity of human life without any particular moral connotation, e.g., *Od.* 24, 255, the *dikē gerontōn* is to rest after a bath; *Od.* 14, 130, weeping and lamentation is *themis gunaikos* when her husband has perished far from home, Alcman, frag. 93, Diehl, *ornuchōn nomōs*, which probably means "the ways of birds" (cf. Heinemann, *Nomos und Physis*, pp. 64–65); and Herodotus, 8, 89, 1, *en cheirōn nomōi*, which means "in hand-to-hand fighting" (cf. J. L. Myres, *Political Ideas of the Greeks* [1927], p. 248, who observes that here the word comes "very near to Aeschylus' use of the verb for 'wielding' a shield or other implement"). Beyond this morally neutral sense, all three words have, of course, the specifically moral sense of "right usage." Hesiod's employment of *anomos* in conjunction with *hubristēs* at *Th.* 307 may be compared with a corresponding expression in the *Odyssey* in terms of *Dikē* and *Themis*: the Cyclopes are *hubristai* . . . *oude dikaiōi* (9, 175) and (106) *athemistoi*

mean here "good distribution"; for what the gods are looking for in this context is not whether there is good distribution, but proper observance of the sacred *Nomos* of respect for strangers.⁴² Finally, in *Autonomia* we encounter a distinctly later term,⁴³ which may be even later than *Isonomia*; and here we see all over again how strongly *-nomia* in a compound would carry the sense of "law," though here, of course, with a strong accent on positive legislation which was entirely absent in *Anomos* and *Eunomia*. It is unlikely, to say the least, that those who used *Autonomia*, in contrast to despotism, to denote "(being ruled by) one's own law" would normally employ the parallel *Isonomia* in any sense other than that of "(being ruled by) equal law."

If "equality of law" is then the literal sense of *Isonomia*, it poses immediately the question whether it means merely (i) "equality before the law" or (ii) "equality maintained through law." The first is not only compatible with the literal sense of the word but is even the most natural rendering of it. Nevertheless, it is clear on historical grounds, and it is now generally agreed, that this is *not* the full meaning of *Isonomia*.⁴⁴ For *unequal* laws, i.e., laws which sanction the unequal distribution of political rights and privileges to different social classes, *might* be upheld quite "equally," i.e., impartially. This is precisely the [350] central conception of the Solonian reforms. Solon's "equal" laws for the noble and the base" define sharply graded political privilege: they restrict the magistracies to the members of the upper-income classes.⁴⁵ But the seriousness of the intent of their impartial application is witnessed by the admission of every citizen to the courts before which ordinary suits could be tried and the magistrates themselves could be called to account under the law.⁴⁷ It is instructive that these reforms which go so far in the direction of judicial equality should not have been termed *Isonomia* in

⁴² I believe this would agree with Ehrenberg's present view, *Aspects of the Ancient World*, pp. 75–76.

⁴³ The first occurrence of *autonomos* is in Herodotus (LSJ s.v.), cf. also Hippocr. *On Airs, Waters, Places* 16.

⁴⁴ See Ehrenberg's excellent remarks on this point in his *RE* article, cols. 295ff.

⁴⁵ The word is *homaōs* (frag. 24, 18, Diehl), but this may well carry the sense of equality, see my "Equality and Justice" (above, n. 29), n. 51. The sense of the "equality" of these laws is illuminated by "straight . . . justice" in the following line, the opposite of the "crooked" justice (cf. frag. 3, 37, Diehl) of the corrupt aristocracy, i.e., undeviating, impartial justice.

⁴⁶ See on this my "Solonian Justice," *CP* 41 (1946), pp. 79–80 (**151–52).

⁴⁷ Arist. *Pol.* 1274a3, "he constituted the jury courts from all the citizens," including the *meteci*. *Ath. Pol.* 7, 3. We can assume that it would be through appeals to a popular court (η ἐκ τοῦ νόμου κρίσις) that the people would exercise the power "to call magistrates to account" (*Pol.* 1274a17 cf. 1281b34). The only limit to the full judicial equality here granted the people would be the continuing jurisdiction of the Areopagus over cases of homicide (the statement that the jury courts "had the decision in all matters both public and private," *Ath. Pol.* 9, 1 must be read with this qualification) and its power to "guard the laws," "supervise the constitution," and "call offenders to account" (*Ath. Pol.* 8, 4).

either Solon's poems, whose ideal is *Eunomia* (frag. 3, Diehl), or any of our later sources.

No less instructive is the case of Sparta. Dedicated to the conception of the "lordship of the law" (*despotēs nomos*),⁴⁸ exemplary throughout the Greek world for its stern fidelity to law, its watchword was *Eunomia*,⁴⁹ not *Isonomia*, and this for the good reason that its members, though social "peers" (*homoioi*), were not political equals; the hereditary status of kings and nobles entitled them to constitutional privileges denied to their fellow citizens.⁵⁰ That *Isonomia* was not applied to the [351] aristocratic regime of Sparta by its most ardent sympathizers⁵¹ is powerful witness to the fact that what the word asserts is not merely that the laws should be equally upheld, but that they should be equal in the wholly different sense of defining the equal share of all the citizens in the control of the state. This is the sense it carries in Herodotus, who uses it to denote the "communizing" of political power, its transference into the hands of the masses;⁵² and this is abundantly borne out by later uses of *Isonomia* to express the peculiar ethos of the equalitarian state.⁵³

But if *this* is the right sense of the word, why should it not mean "equal distribution"? Because "equal distribution" says too much, as "equality before the law" says too little. For what is conceived as equally distributed in *Isonomia* is restricted to *Nomos*, i.e., to the political domain. Long before the term *Isonomia* had been coined, there had been a perfectly good word for "equal distribution," *Isomoiria*; the adjective *isomoros* already occurs in Homer (*Il.* 15, 209). When the embattled peasantry of Attica rebelled against

eupatrid oppression, they did ask for *Isomoiria*,⁵⁴ and their demands included redivision [352] of the land as well as redistribution of political rights and privileges. We know what happened to their demands. They got under Solon a share, though nothing like an equal share, of political power. On the score of economic equality, they got nothing at all, beyond cancellation of debts secured on the debtor's person and the emancipation of those who had fallen into slavery through debt.⁵⁵ In the subsequent development of Athenian democracy, the separation of the two demands became formally complete. The demand for political equality, first voiced by only the poorest sections of the *dēmos*, became the first article of the democratic creed and was progressively implemented in waves of far-reaching reforms which swept away one by one all constitutional guarantees of political privilege for the upper classes.⁵⁶

The demand for equality in the land was quickly dropped from the responsible democratic platform. It was only under the tyrant, Peisistratus,⁵⁷ never again under Cleisthenes, or Pericles, or Cleon, or any other democratic leader that the landless were [353] given Attic land by the state.⁵⁸ In Athens such a demand became a lost cause, the desperate hope of the wholly dispossessed,⁵⁹

⁴⁸ So much I hope will be conceded from Solon's refusal to grant "to the base *Isomoiria* of the rich fatherland with the good" in frag. 23, Diehl. The people's demand for redivision of the land is amply attested in our sources (*Ath. Pol.* 11, 2; *Plut. Sol.* 13, 3 and 16, 1), as well as the general claim to equality (*Plut. Sol.* 14, 2); the slogan *Isomoiria* would be the natural vehicle for the demand for redivision of the land (*Ath. Pol.* 11, 2; *Plut. Sol.* 13, 3 and 16, 1) backed by the general claim to equality (*to ison*, *Plut. Sol.* 14, 2). I believe it is misleading to suggest (Ehrenberg in his *RE* article, col. 298) that the demand for equality played no part in the earlier struggles of the people against the aristocracy and came to the fore only later in the struggle against tyranny. In this instance the demand was for *to ison* and *isomoiria* as well as for *Dike*.

⁴⁹ For the interpretation of the economic aspects of Solon's reforms, see my "Solonian Justice" cited above, n. 45), pp. 73ff. (**1 42ff.) They consist mainly in the legal provision which made all debts secured on the debtor's person unenforceable by law, as well as (probably) the use of state funds to ransom Athenian citizens already sold as slaves in foreign lands. The latter would involve, of course, a certain amount of indirect redistribution of property; but that is as far as Solon went.

⁵⁰ The Cleisthenean constitution, 508 B.C., and the subsequent reforms listed at *Ath. Pol.* 22, 1-2, the reforms of Ephialtes, 462, admission of Zeugitai to eligibility for appointment by lot to archonship, 457; pay for jury-service and for Councillors, ca. 450; pay for attendance at the Assembly, soon after 403.

⁵¹ Though this is only a conjecture, see my "Solonian Justice," p. 79 (**1.51).

⁵² The Athenian empire *did* give land to the landless (some ten thousand Athenians may have left Athens as cleruchs between 509 and 430 according to A. W. Gomme, "Cleruchy," in *Oxford Classical Dictionary* [1949]), but only at the price of expatriation. That a good many of the cleruchs came from the poorer classes is what we would expect, and we know from *IG I² 45(B)* that at least in some cases the cleruchy was reserved exclusively to the *zeugitai* and the *thētes*.

⁵³ Aristotle speaks as though redivision of the land was a regular feature of democratic revolutions in Greece (*Ath. Pol.* 40, 3) and cites "redistribution of estates" as one cause of oligarchic revolutions at *Pol.* 1305a5. Cf. also the undertaking not to countenance "cancellation of private debts or redivision of the land or the houses of Athenians" in the heliastic oath *apud* Demosth. 24.

⁵⁴ *Timocr.*, 149. From these facts alone we could infer that the hope of redivision of the land

⁴⁸ Herodotus 7, 104, 4.

⁴⁹ Cf. Ehrenberg, *Aspects of the Ancient World*, pp. 77ff., and the *CQ* papers by Andrews and Wade-Gery to which he refers at p. 81n.1. *Eunomia* is also the term which Pindar (*I.* 5, 22) applies to the aristocratic order of Aegina.

⁵⁰ The case of the kings is too obvious to call for documentation; for the exclusive eligibility of the nobles to the *Gerousia*, see G. Gilbert, *Constitutional Antiquities of Sparta and Athens* (Eng. tr., London, 1895), p. 48n.2.

⁵¹ The one instance which might be adduced as evidence against this statement, Isocr. *Panath.* 178, actually confirms it. Here Isocrates says that the Spartans established *Isonomia* and *Dēmokratia* among themselves naturally if we are going to turn the Spartans into democrats (cf. also *Arenop.* 61), we may credit them by the same token, with *Isonomia*. *Isonomous* may or may not be the right reading in Ephorus *apud* Strabo 8, 5, 4 (= frag. 18 Muller frag. 117 Jacoby). If it is, it refers not to the classical Spartan constitution, but to an earlier period in which the Spartans were on a footing of equality with the *periekoι*. But I think Jacoby is right in adopting the alternative reading of *isonomous*.

⁵² See n. 38, above.

⁵³ Cf. especially Thuc. 6, 38, 5; Plato *Rep.* 561e, 563b. In all this I do not mean, of course, that to the democrats themselves *Eunomia* and *Isonomia* would be mutually exclusive terms; they would certainly think of the good observance of their "equal" constitution as *eunomeisthai* (so e.g., Aeschines 1, 5). One could hardly claim *Isonomia* to the exclusion of *Eunomia*, though *Eunomia* could be, and was claimed, by those who would have no truck with *Isonomia*, e.g., by Plato in the *Republic* (425a *et passim*), where *Isonomia* occurs only as a term of abuse (n. 34, above).

who never once had the chance to get sponsorship for it from even the most extreme of demagogues. We can see now precisely why *Isoimoria* could never serve as the watchword of the democratic state; it was too deeply compromised with redivision of the land.⁶⁰ The banner which was to fly from the democratic masthead had to proclaim the equal share of all the citizens in the laws yet also to pledge the state to maintain by these same laws the established inequalities of property.⁶¹ What slogan would fit this purpose better than *Isonomia*? [354]

If this interpretation is correct, *Isonomia* is the record of a defeat for the poorest section of the *dēmos*. It signals that paradox of Greek democratic society: the astonishing fact that the man who, as citizen, shares the kingly dignity, the sovereign power of the *dēmos*, may yet as a private individual labor under the indignity of utter destitution.⁶² Everyone must have felt the discrepancy, though it was only the conservatives who dragged this skeleton out of the democratic closet. No impartial estimate of the democratic state can close its eyes to the consequences of this contradiction in terms of moral degradation, political corruption, and ceaseless class conflict, to which Plato

remained alive in the poorest strata of Athenian society; and this is confirmed by the vogue of utopian communistic schemes such as that of the *Ecclesiastusae*, though this also tells us that such demands were not a serious threat to the propertied classes, else they could not be joked about so good-naturedly on the public stage. We can also learn something from the proposals of conservatives like Isocrates (*Peace* 24, *To Phil.* 120, *Areop.* 35) and Aristotle (*Pol.* 1320a36ff.) for settling the destitute on small plots of land.

⁶⁰ It can hardly be an accident that *Isoimoria*, so natural a vehicle for the democratic concept of the state as an equalitarian community, is never used for this purpose in any surviving fifth- or fourth-century historical or political source. Its application to democracy at Thuc. 6, 39, 1 does not refer to the equal share of each and every citizen in the state but to the equal shares of the three "parts" of the state (the rich, the wise, and the masses). In legal contexts the word is used of equality of shares in an estate (Demosth. 48, 19; Is. 1, 2, and 35), which shows how strongly the word retains its connection with allotment of property, as in *Il.* 15, 209 and 704-5, and Solon frag. 23, Diehl.

⁶¹ Cf. the heliastic oath (n. 59, above), and the declaration of the *archōn epōnymus* on his induction "that everyone will have and hold to the end of his term of office whatever (property) he possessed at the beginning of his office" *Ath. Pol.* 56, 2. The most likely date of the introduction of both pledges is the time of the Solonian reforms. Bonner and Smith, *Administration of Justice from Homer to Aristotle I* (Chicago, 1930), p. 62, assume that the declaration of the *archōn epōnymus* is "at least as early as 683-82," but without positive evidence. The need for such a pledge would be felt most acutely after widespread agitation for redistribution of property which, so far as we know, did not arise until the end of this century.

⁶² I am not ignoring the fact that the poor could and did use their political power to extract all kinds of economic tribute from the state at the expense of their wealthier fellow-citizens and/or the "allies." A very considerable redistribution of property was achieved indirectly by these means, but in the last analysis they were only palliatives, never cures, for the chronic malady of poverty. The man who depended on the heliastic *triobolon* for his daily food and that of his family (Aristoph. *Wasps* 300ff.) was in a very poor position to maintain self-respecting independence vis-à-vis the rich.

with merciless logic directs our attention.⁶³ Yet it would be an even graver distortion of history to overdraw, as Plato does, this negative side of the picture. If the landless did not get land, they got in *Isonomia* more than the common people had yet won for themselves anywhere else since the dawn of history. Hitherto material progress had normally been coeval with the concentration of both political and economic power in the hands of kings and nobles. *Isonomia* refused to countenance either the ancient monopoly of law in the hands of a hereditary aristocracy or the claims to political privilege of the new plutocracy whose social power rivaled that of the old nobility. It promised the poorest citizen an equal right in the law-making, law-administering, law-enforcing power of the state. It expressed the spirit [355] of a constitution, hitherto undreamed of in civilized society, which declared that the poor man's share in law and political office was equal to that of the noble and the rich.⁶⁴ This was implied in *Isonomia*, and one can see why a word which said so much should pass from a description of a special feature of democracy into a name for the whole constitution. The same thing happened in the case of *Isēgoria* and *Isokratia*,⁶⁵ but with nothing like the success of *Isonomia*. Equal law, equal liberty of speech, equal power in government—each of these seizes on features so essential to democracy that none of them could exist without the others, none could be realized without the support of the whole constitution, so that any of them singly could serve to designate the whole. It is an impressive witness to the importance which the members of the democratic *Polis* attached to its equal law that *Isonomia* should be their favorite ideological slogan, pre-eminent over even *Isēgoria* and *Isokratia*.

III

But there is something more in *Isonomia* than the sense that we have so far explored. This is a subtler, more elusive meaning, and it is hard to state it without overstating it. Yet the attempt must be made, for to omit it would be to ignore a part of its meaning, which was not only a vital part of democratic ideology but accounts in large measure for the appeal of *Isonomia* to more conservative shades of political opinion. I can best suggest what this is by calling attention to the fact that the junction of equality and law may be read not only in the sense of law as the guarantee of equality, but also in the

⁶³ *Rep.* 421c ff.; *Laws* 715b and 832b, c.

⁶⁴ *Eur. Suppl.* 404-37.

⁶⁵ Herodotus 5, 78 and 5, 92, a, 1 respectively. In none of the other fifth- and fourth-century instances known to me (Eupolis, 291; ps.-Xen. *Ath. Pol.* 1, 12, Xen. *Cyr.* I, 3, 10, Demosth. 21, 124) does *Isēgoria* seem to stand as a generalized expression for democracy, though the importance attached to the idea which it expresses is, of course, enormous (see, e.g., *Eur. Suppl.* 435-41). Nor do I know of any such usage of *Isokratia* outside of Herodotus.

converse sense of equality as the guarantee of law. In the former sense, which has occupied our attention in the preceding section, law appears as the means to the end of political equality; in the latter, law, or the rule of law, is the end, political equality is the means to [356] this end. To take the word in this latter sense is to assert that its conformity to law will be ensured by its equalitarian distribution of political power. It is my contention that to a thoughtful democrat *Isonomia* would convey both of these senses, though one or the other might predominate in different contexts, and that the latter sense will account, as the former alone would not, for the reluctant admiration which even opponents of democracy could feel for *Isonomia*.

Long before Aristotle produced his classical formulation of the Rule of Law,⁶⁶ it had been the conviction of the democrats that their constitution, and theirs alone, measured up to this ideal.⁶⁷ Thus, to take comparatively late expressions of this conviction, Demosthenes identifies democracy with government by law in explicit contrast to both monarchy and oligarchy;⁶⁸ Aeschines remarks that "tyrannies and oligarchies are governed by the tempers of their lords, democratic states by the established laws."⁶⁹ On what grounds would they justify this conviction? What is there about their state which makes democrats assert so confidently that it alone is governed by law? The question unfortunately remains unanswered in the orators, probably because the answer seemed too obvious to themselves and their audience to call for statement and discussion. It seems to be taken for granted in Aeschines' cursory contrast between "the oligarchs and those who are governed by an unequal constitution" [357] and the Athenians, "who have the equal and lawabiding constitution,"⁷⁰ without any responsible encounter with the question why an "equal constitution" should be in fact more "law-abiding" than an "unequal" one.⁷¹ For an account of the nexus between equality and the rule of law, we

⁶⁶ *Pol.* 1286a8ff., 1287a19ff.

⁶⁷ The assessment of the historical accuracy of this claim is not my business in this paper; all that matters strictly to my argument is that the conviction was actually held by the democrats themselves, which one would hardly suspect from Aristotle's identification of "extreme democracy" with "mass-rule" against the "rule of law" (*Pol.* 1292a5ff.). If I may venture an unsupported opinion, it is that, in spite of a margin of ever-present lawlessness, radical democracy did substantially conform to the rule of law both in constitutional design (e.g., the *graphē paranómōn*) and in the bulk of its day-to-day practice. I do think, however, that the Attic orators were wrong in blanketing oligarchy as a whole with the charge of lawlessness; there is no good reason to doubt that an enlightened oligarchy, like that of Thebes, would substantially conform in its way to the ideal of the rule of law. The Attic orators could only make their point stick by picking out lawless oligarchies, of which there were doubtless plenty.

⁶⁸ 6 (*2 Phil.*), 25 for the first, 24 (*Ag. Timocr.*), 75–76 for the second.

⁶⁹ 1 (*Ag. Timarch.*), 4.

⁷⁰ *Ibid.*, p. 5. As Ehrenberg has remarked, *isēn kai ennomon* here is doubtless a periphrasis for *Isonomia*.

⁷¹ Aeschines' reasoning, such as it is, is that "in a democracy the persons of the citizens and the constitution are safeguarded by the laws, while those of tyrants and oligarchs (are safeguarded) by

must go back to a time when habit had not yet turned a profound idea into a shallow dogma.

Otanes' main argument for *Isonomia* in the Debate on Constitutions is that this will be a law-abiding state, free from the lawlessness of tyranny. But he does not rest his case with asserting and documenting the tyrant's *hubris*. He adds an *explanation* of the causes of the tyrant's flouting of the holy restraints of *Dikē* which is our first Western record of a revolutionary advance in man's understanding of the problem of government. The traditional explanation of the perversion of justice by its official guardians had been couched in terms of purely personal morality. Hesiod's bitter invectives against the bribe-eating kings had been premised on the assumption that their crooked judgements were caused by their personal "foolishness" and "evil Mind."⁷² There is never a hint in all his complaints that their offenses against *Dikē* might be due to the essential injustice of the institutions which made them the irresponsible dispensers of law and judgement. Even Solon, who, unlike Hesiod, is most emphatically a political reformer, has no clear perception of the fact that unequal political privilege is *per se* the source of the *Dysnomia* of the eupatrids. He blames their political vices on their personal immorality: "they know [358] not how to restrain themselves from excess, nor to order their pleasures in peaceableness of life."⁷³ Indeed even Plato, who understood as well as anyone ever did the interdependence of personal and social virtue, was to remain under the spell of the moralistic oversimplification of the problem of social justice. He holds that a man whose personal wisdom and virtue meet the high standards of philosophic perfection, *should* be entrusted with absolute, irresponsible power, and that his personal integrity, armed with sufficient resources of persuasion and compulsion, could and would establish the perfectly just state.⁷⁴

The exponent of democracy in Herodotus strikes out along a radically different path when he traces the vices of tyranny to the vicious scheme of unequal power of which the tyrant's personal character is itself the inevitable victim. The tyrant's *hubris*, says Otanes, is the result not of the envy which is

suspicion and armed force," i.e., that democratic law does the job which coercive force does in undemocratic states. Taken at face value this is nonsense, since, on the one hand, law is no monopoly of democracy and, on the other, democratic law has also coercive sanctions. What Aeschines doubtless means to say is that in democracy law has the added sanction of voluntary compliance and is, to that extent, a better safeguard of the person and the constitution. This is a valuable insight so far as it goes, but it ignores the vital question why coercive power should also be used more law-abidingly in the "equal" constitutions.

⁷² *Op.* 38–41, 260–64.

⁷³ *Frag.* 3, 9–10. Dichtl; cf. 4, 3–5. Dichtl. The charge of *adikos noos*, *frag.* 3, 7, is repeated from Hesiod, *Op.* 260.

⁷⁴ This is the view of the *Republic* and the *Politicus*. It is *not* withdrawn in the *Laws*, where Plato merely gives up the hope that such a person can be found (691c, d; 713c); see especially 876c, d.

common to all men,⁷⁵ but of the special privilege of his position. "Even the best of men," he asserts, placed in the tyrant's seat of irresponsible power, "would be changed from his wonted mind." When he defends the rule of the people under the rubric of *Isonomia*, Otanes does not idealize the people's virtue. He does not claim that the people's rule will be good because the people are just and wise. He says only that their rule will be responsible and equal, assuming that it will be saved by this very fact from the *hubris* which not even the best of monarchs can avoid. He believes that the power of any man in office, when counterpoised against the equal power of his fellows to bring him to judgment under the law, will be held under constraint of equality within the just limits of lawful rule.

It is this sense of *Isonomia*—that of an equalitarian distribution of political power, assuring responsible and, therefore, law-abiding government—which best explains the use of *Oligarchia isonomos* by the Theban spokesmen in Thuc., III, 62. The point at issue in this discussion is whether the city of Thebes can be held responsible for the act of its government when it betrayed [359] the Greek cause at the time of the Persian invasion. The Thebans' argument to the contrary is premised on a distinction between two types of government, which we may call isonomic and non-isonomic respectively. The contemporary constitution of Thebes is brought under the first head by attaching specifically the term *isonomos* to their brand of oligarchy, while their mention of democracy *tout court* under the same head assumes that its title to *Isonomia* is so obvious that it does not call for special mention. On the other side, there is tyranny and the earlier government of Thebes, where "a *Dunasteia* of a few men held power." The difference between the two types consists in the fact that the first, and only the first, is (i) a government of law, (ii) a responsible government, whose decisions are those of "the whole of a state having the power to govern itself (*xumpasa polis autokratōr*)."⁷⁶ What accounts for the difference is not spelled out; but it is clearly implied in the statement that when the earlier *Dunasteia* led Thebes to the Persian alliance, it did so by "forcibly coercing the masses (*κατέχοντες ἰσχύϊ τὸ πλῆθος*)."⁷⁷ It is the unequal power of the rulers of a non-isonomic state that accounts for their ability to act without restraint of law and force their own arbitrary will upon the governed, pushing them into a course of action for which they cannot be held responsible, since they lacked the power to accept or reject it for themselves. Clearly this cannot happen in democracy where power belongs to the people, and officials do not decide the policies of the state but administer the policies which the people decide.⁷⁸ By grafting the democratic slogan of *Isonomia* on

their own constitution, the Theban speakers claim that neither can this happen in their own contemporary state and for the same reason as in democracy. And they can make this claim in good faith because, as we know from independent sources, their constitution was a genuinely equalitarian one within the limits of its restricted franchise.⁷⁹ Though oligarchic, because it excluded over half of native Thebans from full-fledged citizenship, it [360] could nonetheless be justly termed an *Oligarchia isomos*, because it gave every member of the enfranchised civic body an equal share in the government, with no special privilege for the nobility; it entrusted the sovereign decisions of the state to *Boulai*, in which each hoplite-citizen took his place by regular rotation. Thus here, too, as in Otanes' speech in Herodotus, *Isonomia* designates a political order in which the rule of law and responsible government are maintained by the equal distribution of political power.⁷⁸

But what lay back of Otanes' speech? So profound an apprehension of the corrupting effects of irresponsible power on the character of those who hold it and of the equal diffusion of power as the remedy for injustice, expressed so confidently yet unpretentiously by this exponent of *Isonomia*, suggests a long antecedent development. How far back this development extends, we can judge from the fact that by the middle of the sixth century the implied idea had been projected from politics to cosmology; and nothing gives us a better sense of the force with which this political insight struck the minds of its discoverers than the fact that it provided the pattern on which the first Western concept of nature as a domain of inherent, unexceptionable order was designed.⁷⁹ The word *Isonomia* does not occur, of course, in the fragments of Anaximander, the [361] founder of this concept of nature; we cannot say that he used the word or knew it. His famous fragment (B1) speaks not of law but "justice" (*dikē*) and "reparation" (*tisis*). But what matters here is that in his system the guarantee of this "just" order, where "injustice" is unfailingly redressed, is not

The evidence is best collected and discussed in H. Swoboda, "Studien zur Verfassung Boeotiens," *Klio* 10 (1910), pp. 315ff.

⁷⁸ I forego an extensive analysis of the Platonic use of *Isonomos* (n. 34, above). Briefly, in *Ep.* 7, 326d the contrast is between the "just and *isonomos politeia*" and the arbitrary rule (*dunasteionas*) which he imputes to "tyrannies, oligarchies, and democracies", he is turning the table on the democrats by saying, in effect, that their own slogan is too good for them, as for their tyrannic and oligarchic rivals. By *Isonomia* he clearly understands a rule of stable law (cf. 326c, *ēremēsai kata nomous*); though what he would do with the first half of the compound is hard to say, unless he would reinterpret it in accordance with his concept of "proportional" equality (*Lan.* 744c, 757a ff.; cf. *Rep.* 558c), which is, of course, the denial of democratic ("arithmetic") equality. The use of *Isonomia* at *Menex.* 239a is less instructive for our purpose. The same semantic legerdemain which transforms that which is "called" democracy into "aristocracy with the good opinion of the mass" reduces *Isonomia* to (i) *Isogonia* and (ii) government by those preeminent in "repute of virtue and wisdom" (239a and cf. 238d). (i) and (ii) are the qualifications which would make *Isonomia* acceptable to Plato, if Athens could measure up to them.

⁷⁹ For the reconstruction of Anaximander's cosmology which I assume in this discussion, see the paper cited above (n. 29), pp. 168ff. (**1.77ff.)

⁷⁵ Being inherent in man's nature: φθόνος δὲ ἀρχήθεν ἐμφύεται ἀνθρώποις, 3, 80-3.

⁷⁶ Exactly the same construction is put on *Isonomia* by Thucydides at 4, 78, 2-3. Brasidas passed through Thessaly; but, since the Thessalian masses were always friendly to Athens, "if *Isonomia*, rather than *Dunasteia*, had been the local Thessalian usage, Brasidas would not have passed."

the preponderant power of some higher, law-ordaining, law-enforcing agency, but the equal power of the basic constituents of nature to hold each other in check. The former idea would have been naturally suggested to his mind by the traditional, Hesiodic conception of divine justice. Hesiod's poems had impressed on the Greek imagination the conviction that Zeus is the guardian of justice, his wisdom and might its only sure support; if there is law and order on Olympus above, in the Tartarus below, and in the human *polis* upon the earth, it is because Zeus has fought and subdued every rebellious power and is now able to crush, according to his own designs and in his own good time, anyone who flouts the ordinances of his sovereign will.⁸⁰ Anaximander, who thinks of his *Apeiron* as divine, and endows it with the traditional attributes of divinity, immortality and agelessness, would have every reason to transfer to it a guardianship of justice patterned on that of Hesiod's Zeus. His alternative solution of the problem has the force of a deliberate rejection of this traditional conception. He chooses to think of nature as a self-regulative equilibrium, a system whose "justice" is preserved by the internal equipoise of its components, not by the intervention of any higher, external power.⁸¹ His solution of the problem of cosmic justice is modeled on a notion of political [362] justice which is utterly different from either the aristocratic justice of Hesiod's *polis* or the monarchic justice of Hesiod's pantheon: the notion which answers substantially to *Isonomia*, for it assumes that the only reliable preservative of justice in a community is the equal distribution of power among its members.

Just such a notion is designated by *Isonomia* in Alcmaeon's fragment. The equalitarian order which is normative for Anaximander's universe is now applied to the *kosmos* of health within the human organism. For Alcmaeon, as for the "Hippocratic" medicine of Ionia and the Sicilian medicine of the Empedoclean school,⁸² the normal constitution of the organism is the *krasis* of

⁸⁰ The goddess *Dikē*, of course, is very much concerned with human justice and does some punishing of injustice on her own account (*Op.* 223); but she is the "daughter" of Zeus and anyhow she, like all the other gods, has received her "honor" or office from Zeus (*Th.* 74, 885); whatever power she has is derived from Zeus and ultimately dependent on his supreme force (*Op.* 259ff.). Similarly for "Oath who gives most woe to mortals if anyone wilfully swears a false oath" (*Th.* 231), for "Zeus' thrice ten thousand" guardians of "judgments and deeds of wrong" (*Op.* 253–55), and the Fates who "pursue the transgressions of men and of gods" (*Th.* 220). In some passages (*Op.* 2–8, 267–69), Zeus is directly the watcher and rewarder of human justice. Cf. F. Solmsen, *Hesiod and Aeschylus* (Ithaca, 1949), pp. 47ff., 64 ff., 83ff., 90ff.

⁸¹ For the "government" of the created world by the *Apeiron* in accordance with this pattern, see (my "Equality and Justice") (at n. 29), pp. 172–73 (**1.80–81).

⁸² For the Hippocratics see *ibid.*, pp. 156–58 (**1.58–61). For Empedocles see, e.g., his theory that vision is best when the dark-light opposites (water-fire) are in equilibrium, "for the best tempered and most excellent [state of the organism with respect to vision] is the one which consists of both in equal proportions", also his view that "all those in whom the mixture [of the four elements] is equal or nearly so . . . are the wisest and have the most exact perceptions" (Theophr. *De Sensu* 9 and 11 = *Enp.* A 86; translations after Burnet).

equal "powers"; the "monarchic" preponderance of any power is a diseased condition, destructive of the organism. Such a medical use of *Isonomia* is certainly patterned on a democratic concept of the political order, though it is by no means necessary to assume that Alcmaeon so used it *because* he was himself a partisan of democracy. Once we have got rid of his "Pythagoreanism," we must admit that of his political persuasion we know exactly nothing.⁸³ This leaves us with several possibilities: He may have been himself an admirer of the regime which his namesakes, the Alcmaeonids, had recently established at Athens. That a rationalistic physician of Croton might have just such sympathies is perfectly possible, even (as is not unlikely) if he himself were a member of the ruling "thousand"; liberal aristocrats there must have been everywhere throughout Greece; and in the case of Croton we have one [363] tradition which informs us that the proposal to democratize the constitution was sponsored by some members of the "thousand."⁸⁴ Alternatively, he may have used *Isonomia*, the term which Cleisthenean democracy (at the latest) had popularized in Greek speech, as simply the most appropriate metaphor for his equalitarian conception of healthful order. Finally, it is not impossible that the same metaphor had been already applied to Anaximander's concept of nature; if so, Alcmaeon could have borrowed both the word and the concept of order which it expressed, with or without the wish to underwrite its political connotations.⁸⁵ I do not see how we can decide among these possibilities, or that we need to; though in the absence of positive evidence to the contrary, it is reasonable to assume that a man who gave *Isonomia* so prominent a place in his medical thought would not be unfriendly to its political

⁸³ The only information supplied us by our sources on this point is purely negative, no political activity or opinion is ever imputed to him. This may be significant, since political attitudes or legislative functions are imputed to nearly all the major philosophical figures of the sixth and fifth centuries: Anaximander, Heraclitus, Parmenides, Zeno, Empedocles. Had he played a political role of any prominence we would expect some trace of it, especially in the lives of Pythagoras which claim Alcmaeon as a "Pythagorean."

⁸⁴ *Iambli. V.P.* 257, with the generally accepted emendation of *chronōn* (which makes no sense at all) to *chilōn*. I see no reason to doubt that this part of the account comes from Timaeus, though the names "Hippasus, Diodorus, Theages" may not be due to him but to Apollonius (von Fritz, "Pythagorean Politics in Southern Italy," pp. 59ff.). I should be more inclined to date this episode somewhat later than 509 (as does Minar, *Early Pythagorean Politics*, pp. 53ff.), perhaps by a few years (T. J. Dunbabin, *The Western Greeks* [Oxford, 1948], p. 366n.9) or decades (von Fritz, p. 87), but in any case doubtless within Alcmaeon's lifetime. I see no reason to doubt the statement of the source (*loc. cit.*) that Pythagorean speakers opposed the proposal.

⁸⁵ I consider this the least likely of the three possibilities, since (i) we have no evidence that Anaximander used *Isonomia* (though what we know of his philosophical vocabulary is so meager, that neither can we say that he did not) and (ii) Alcmaeon's interests were medical and physiological, not cosmological (though this too is not a conclusive objection, since the analogy of physical macrocosm and human microcosm was so vivid in Greek thought that had a physician found *Isonomia* in a cosmology, he could have transferred it to medicine without any sort of commitment to its cosmological validity).

import. The one possibility which, I believe, should be ruled out is that *Isonomia* was a generalization from the political structure of contemporary Croton.⁸⁶ As aristocracies go, this was not an [364] excessively narrow one; but it was certainly a far more restricted one than, say, the oligarchy established at Thebes after the Persian wars, barring from so much as attendance at the Assembly all but the privileged "thousand," who, on any estimate, must have been a tiny fraction of the native population.⁸⁷ Such a constitution, whose marked inequalities were the butt of sharp attacks by democratic forces, could scarcely be named by the word whose hallmark was Equality.

Larsen has rightly stressed that in this fragment, as indeed in all of the major contexts in which the word occurs, *Isonomia* appears in sharpest opposition to the one-man rule of tyranny. But it would be an error to infer from this⁸⁸ that *Isonomia* is, therefore, simply the rejection of the extreme inequality of tyranny and could be used by aristocrats no less than by the champions of democracy. Such an inference, as I have urged above, cannot be supported by a single item of positive evidence. But my objection can be grounded on far larger historical grounds, by recalling the role of equality in the political struggles of the Greek world. The demand for equality was first raised against those who held, by hereditary right, the monopoly of government long before tyranny reared its head in Greece. In their struggle against the nobility, the people saw that, without an equal share in the law, they could not be safe from legal oppression. But it was only in the later encounter with tyranny that the people discovered how vain is the promise of equality unless grounded in the rule of law and, conversely, that only the attainment of equality can secure the rule of law. Time and [365] again a tyrant must have won popular support by promising the people to break by force the legal power of the nobles. When they accepted his gift, the people found through bitter experience that the hope of equality under the tyrant's lawless rule was illusory, and that the only way

this hope could be realized was to make government responsible to the governed by extending the equal share of all the citizens in the control of the state.

It was this lesson from past experience and goal for future endeavor that was crystallized in the slogan of *Isonomia*. It was not an aristocratic idea, for though the nobles at times made common cause with the people against the tyrant, their goal was not an advance to the equality of *Isonomia* but a retreat to traditional inequalities sanctioned by *Eunomia*. Oligarchies could use the term *Isonomia*, but only by borrowing it from democracy and only by approximating as best they could to the democratic pattern. In the degree to which a liberal oligarchy, such as that of Thebes, suppressed the political privileges of its noble clans and attained a measure of responsible government by granting an equal share in government to its fully enfranchised civic body, it too could speak of its constitution as *Oligarchia isonomos*. Democracy had traveled much further along this road when this "fairest of names" had become the proud title of its own constitution. When in due course this was displaced as a proper name by the more prosaic and more precise *Dēmokratia*, *Isonomia* still remained the favorite slogan of democracy, for it alone expressed its greatest achievement, its pursuit of the goal of political equality to the farthest limits envisaged by the Greek mind, and this not in defiance, but in support, of the rule of law.⁸⁹

I wish to make grateful acknowledgment of a Fellowship granted me by the John Simon Guggenheim Foundation which has enabled me to undertake this and other studies in Greek political ideas. A debt of another sort I owe my colleague, Friedrich Solmsen, who read an earlier draft of this paper and made a number of valuable criticisms and suggestions.

⁸⁶ As seems to be assumed by both Larsen ("Cleisthenes," p. 9) and Ehrenberg (OD, p. 535), taking Alcmaeon's *Isonomia* to mean a "balanced state." What kind of "balanced state" would Croton be, if it disfranchised the overwhelming proportion of the *dēmos* (n. 87, below)? But if "balanced state" were in Alcmaeon's mind, then, as Ehrenberg himself remarks (*loc. cit.*), he would have spoken of it as *Eunomia*, not *Isonomia*.

⁸⁷ Dunbabin (*The Western Greeks*, p. 365) does not seem to think the figure of half a million excessive for the population of sixth-century Sybaris. If Croton were only half its size—and a state which destroyed Sybaris and established a hegemony over several of its neighbors between 510 and 480 (Dunbabin, p. 368) could not be a small one—the restriction of political rights to a thousand would mean the disfranchisement of well over 90 percent of the native Crotonians.

⁸⁸ As Larsen, of course, does not, except in his treatment of Alcmaeon's fragment (*loc. cit.*). This is the only part of his paper to which I have grave objections. Its revision along the lines suggested here would be wholly in accord with his general thesis and make his argument completely coherent. Ehrenberg's view of *Isonomia* as the watchword of the Cleisthenean reforms would be similarly strengthened and simplified by surrendering the notion that it had been an "aristocratic" slogan only a couple of years earlier.

CORNFORD'S *PRINCIPIUM SAPIENTIAE*

ALL THROUGH HIS LIFE Cornford was a dissenter. It is characteristic of him that he should turn in his later years against an assumption which he himself had first accepted along with the great majority of modern scholars: that the natural philosophy of Ionia from Anaximander to the atomists was "scientific," in contrast with the religious philosophy of the Pythagoreans and the rationalistic philosophy of the Eleatics. Cornford had expounded just this notion in his early book, *From Religion to Philosophy* (London, 1912). Heretical in many ways, this work had taken for granted the orthodox view of the "scientific" motives and nature of Ionian cosmology; it described the atomists, for example, as "behaving exactly as a modern man of science would do, remodeling the hypothetical substance to 'save appearances'" (137). I do not know how long it was before Cornford came to question this view. He had certainly done so by 1931. His Inaugural Lecture in that year, "The Laws of Motion in Ancient Thought" (Cambridge), argues that this topic, the proper theme of physical science, was completely misconceived by the pre-Socratics, who tried to explain it by the supposed tendency of motion of "like to like," a notion derived from the common sense of their own day and ultimately from the "unacknowledged principles of magic" (44) and mimetic rites. A few years later ("Greek Natural Philosophy and Modern Science," in *Background to Modern Science*, J. Needham and W. Pagel [eds.], Cambridge, 1938), he argued that the method, objective, and motivation of Greek natural philosophy were all different from those of modern science: its method was marked by the neglect of experiment and indulgence in speculative dogmas unverifiable by observation; its objective was to understand "what things really and ultimately are" (10), instead of how they behave; and its motivation lacked the essential concern of the modern scientist, to understand nature for the purpose of furthering practical control. Cornford devoted the closing years of his life to the effort to round out and document this argument, and we can read the all but finished result in the present book. Its scholarship, unfortunately, is neither dispassionate nor precise. The book abounds in remarks which are opinionated tangents on the available evidence

Review of F. M. Cornford, *Principium Sapientiae: The Origins of Greek Philosophical Thought* (Cambridge: Cambridge University Press, 1952). From *Gnomon* 27 (1955): 65-76. Reprinted in Furlley & Allen 1, pp. 42-55. Used by permission. Minor changes in spelling and punctuation have been made. German-style italics from the original article, overlooked in the reprint, have been restored.

rather than sober conclusions from it. It nevertheless commands attention as the work of an imaginative man who has a rare power to challenge the mind of his reader. An exhaustive commentary on the mass of ideas it contains is quite impossible in this review, and I am anyhow not competent to discuss one of its important topics, the affinities between Greek cosmogonies and the creation myths of Babylonians, Canaanites, and others. All I can do here is to reckon, quite selectively, with those of its theses which bear directly on the nature, temper, and immediate origins of pre-Socratic cosmology. [65]

The most vigorous part of Cornford's argument is in the opening chapter, where he contends that the experimental method is foreign to the pre-Socratics. He points out, quite rightly, that the star example of a physical "experiment" in the natural philosophers, the clepsydra, was not an experiment at all, in the proper sense of the word: Empedocles "did not invent the clepsydra . . . with a view to testing the hypothesis that air has some substance, and then abiding by the unforeseen results of his experiments" (6). Both the clepsydra and the inflated skins, to which Anaxagoras also appealed to confirm the same hypothesis, had been used in ordinary life long before this time. "To draw a clear-sighted inference from familiar experience is not the same thing as to practice the experimental method." Conversely, Cornford argues (6-7) that there are plenty of genuine experiments the *physiologoi* could have performed, if they were so minded: "Had Anaximenes set a jar full of water outside his door on a frosty night and found it split in the morning, he might have found that ice fills more space than water and revised his theory."¹ He proceeds: "The neglect is more remarkable because a similar experiment, made for another purpose, is recorded by a Hippocratic writer, *Airs, Waters, Places*, Ch. 8."

But he fails to notice how very odd an experiment this is: it is designed to prove that "freezing dries up and causes to disappear the lightest and brightest" parts of water, because it is held to involve an *ekkrisis* of these from the heavier, darkest parts of water. This is a consequence of the theory of Anaxagoras (B12, 15, 16) that the transition from a rarer to a denser state involves

¹ But this conclusion is not so easy as Cornford fancies. The experiment might have been made, and its result taken to confirm the theory: "So führen arabische Philosophen das Zerspringen der Flaschen, wenn Wasser in ihnen gefriert, darauf zurück, daß das Wasser sich dabei zusammenzieht und ein Vakuum entsteht, das aber nicht möglich ist. Daher wird die Flasche zerdrückt," E. Wiedemann, "Über das Experiment im Altertum und Mittelalter," *Unterrichtsblätter für Mathematik und Naturwissenschaft*, 12 (1906), 122. Cornford does not seem to be aware that in the absence of the right kind of theory experiment is not only useless but may even be misleading, for it may be taken to prove the wrong thing: so it would in this case, and so it did in several of the few recorded experiments of classical Greece (e.g. that of Anaximenes B1) designed to prove that compression reduces the temperature of air, that at *Peri sarkon*, Ch. 1. A story purports to prove that water passes through the windpipe into the lungs in the course of drinking, that of Aristotle *Hist. Anim.* 590a18ff. cf. *Meteor.* 358³⁵35ff.), allegedly proving that a certain quantity of "fresh and drinkable" water will be found in a vessel of molded wax submerged for twenty-four hours in sea-water.

the segregation of the bright, dry, rare, warm from their opposites, dark, moist, dense, cold.² To show this our author would have had to measure the bulk of the frozen water and find whether this would be, as he expects, smaller than the bulk of the same water before it froze. What he does instead is only to measure the bulk of the water [66] after it was melted (ὁκόταν δὲ λυθῇ ἀναμετρεῖν) and compare this with the measure of the water originally poured into the vessel (*metrōi encheas*). Such loss of water as he observed (it would be slight, but we need not question his report that he did observe it) would be obviously due to evaporation and would do nothing to confirm his theory.³

This single instance shows the difficulty in the proper conduct of even the simplest of experiments in the absence of a theory which gives the right direction to observation. It also brings out the fact that the Hippocratics, in spite of their occasional disclaimer of "hypotheses," could not dispense with physical and physiological theories, and that the ones they invoked suffered from the same vices as those of the *physiologoi*. Cornford ignores this fact which leaps to the eye in reading any Hippocratic treatise except those which, like the *Epidemics*, restrict themselves to minute description of symptoms and attendant circumstances, or highly specialized essays, like *On Fractures*, which can afford to ignore the aetiology of disease. His thesis (Ch. 3) is that the empirical method, foreign to the philosophers, was discovered and followed by the physicians. This generalization is surely wrong. Those very treatises which start by denouncing a philosophical theory proceed a few pages later to propound a theory of their own, no less speculative in its own way, and directly or indirectly derived from the *physiologoi*. Thus *The Nature of Man* rejects the philosophical doctrine that "The One and the All" and, consequently, man, are just "one thing" (Ch. 1), only to assert that man and, indeed, "animals . . . and all other things" (Ch. 3) consist of just four things, "being the same at all times alike" (Littre 6, 36, 13; cf. Empedocles B17, 34–35)—a theory which, as has been often remarked, is closely modeled on Empedocles. *Ancient Medicine*, which has such hard words for Empedocles, puts forward a theory of indefinitely numerous *dunameis*, none of them ever

² Of these, bright-dark occur explicitly in the *Peri aerōn*, and the others are obviously implied; the mention of *glukē* in *Peri aerōn* would not be foreign to Anaxagoras' thought (*kai chroia kai hēdonas* at B4; cf. Theophr. *De sensu* 28) nor that of *kouphon* (B10 *sub fin.*). That *limnaia* waters are salty because their sweeter parts are evaporated by the sun, asserted earlier in the same chapter, is also a consequence of the same general theory and was specifically held by Anaxagoras (A90).

³ Heidel, *The Heroic Age of Greek Science* (Baltimore 1939), 169, takes a kinder view of the experiment but only by ignoring what our author himself says he is proving, and assuming instead that the author is proving "the sublimation, or the immediate vaporization of ice without passing through the liquid state," which has no foundation in the text.

pure or "by itself," whose very wording is reminiscent of Anaxagoras.⁴ [67] Both authors, like so many of the Hippocratics, take the equitable balance of qualitatively opposite components as the norm of health, employing a pattern prominent in the thought of the *physiologoi*. Acute observers of medical symptoms as the Hippocratics certainly were, the stuff and temper of their theory is no different from that of the *physiologoi*. Cornford credits them with "the beginnings of a genuinely experimental procedure" (38). But if "experimental procedure" is used with any rigor at all, we can ascribe it to the Hippocratics no more than to the *physiologoi*. In neither case were theories put forward as tentative hypotheses, whose fate would be determined by systematic experiment.⁵ "Le médecin ancien," writes the author of an admirably

⁴ Cf. ἐφ' ἑαυτοῦ γενέσθαι, ἐπ' ἑωυτοῦ ἔστιν, Anaxagoras B6 12, with *epi' heōutou*, V. M. [= *Verus Medicus*], Ch. 14, Ch. 15 (Littre 1, 602, 14; 604, 15). Festugière (*L'Ancienne médecine*, Paris 1948, 53) adduces a number of instances of *epi' heōutou* in other Hippocratic writings. But note that they refer to things like bread, meat, fish, honey, not to their constituent *dunameis*; the only two instances of the latter are, to my knowledge, Anaxagoras and V. M. There are other points of similarity. When things are mixed, says V. M., Ch. 14, they are not *phanera*; only when something *apokritē* it becomes *phaneron*. Anaxagoras has the same view: when things were all mixed together, *ouden endēlon ēn* (B1); in the *apokrinomena*, each thing is *endēlotatu* those powers which preponderate in it. V. M. holds that the multiple powers which are in man are also in other things, not only in nutrients (Ch. 14, Littre 1, 602, 15ff.), but *καὶ ἐν σκύτει καὶ ἐν ἄλλοις καὶ ἐν ἄλλοις πολλοῖς* (Ch. 15, Littre 1, 606, 11); so does, of course, Anaxagoras. That there is no absolutely unmixed thing is common to V. M. and Anaxagoras (who, however, would exempt mind), as also that there is relative *apokrisis*. V. M. speaks of the *akrētia* as *ischuron* (Ch. 14 *passim*); Anaxagoras says that Mind *ischuei megiston* because it is absolutely unmixed (B12). Anaxagoras' curious doctrine that all sensation is accompanied by pain would make sense if he too held a doctrine of *krasis* whose disturbance *lupeei ton anthropon* (Ch. 14, Littre 1, 602, 13, 14), and assumed that the sensation of any quality involved the concurrent predominance of that quality in the organ *sin*. His only known medical doctrine (*Arist.*, *De part. anim.* 677a^{5ff.}) is that *chole* is the cause of acute disease; this agrees with V. M., which never mentions phlegma but only conceives of the *chole* (Ch. 19, Littre 1, 618, 6). I adduce all this detail because the possible connection of V. M. to Anaxagoras is generally ignored in the literature (but see W. H. S. Jones, *Hippocrates* [London 1923] 5 and Festugière, *loc. cit.*). I should not infer that the author of V. M. subscribes to the whole of Anaxagoras' philosophy, which is absolutely precluded by his doctrine of *mind*. All who have written *peri physion* (Ch. 20). But he may have read one of Anaxagoras' physiological or medical treatises, or, failing this, been influenced by someone who had taken over parts of Anaxagoras' doctrine. That it was he who influenced Anaxagoras is chronologically most unlikely, an Ionian treatise which combats Empedoclean influence on medicine could hardly have preceded the formulation of Anaxagoras' theory.

⁵ The word *hypothesis* is never used in this sense by the Hippocratics. It is singularly absent from their writings, though by the beginning of the fourth century at the latest (Plato, *Meno* 86e). It had been well established in geometry. Of the five instances in which it occurs, four are in V. M. (Littre 1, 570, 1, 572, 4, 598, 3, 604, 13) in the perorative sense of arbitrary unverifiable philosophical theory. The other, in *Peri Phusēn* (Littre 6, 114, 18), is used of the author's philosophical theory that air is the single *idea kai aithrē* of all diseases (Ch. 2) as also the cause of all events throughout the universe (Ch. 3); *archēn hypothesthai* is used similarly in *Peri Sarkōn* (Ch. 1,

balanced recent study, "n'envisage jamais à l'instar du savant moderne d'avoir à modifier son principe si l'expérience le contredit."⁶ Cornford thinks it significant that "of all the recorded examples of anything resembling an experiment . . . , the great majority occur in the medical writers."⁷ Is it, really? Is there any reason to think that if the writings of the *physiologoi* had survived in any quantity, they would not have matched the few (a dozen at most) [68] experiments recorded in well over a thousand pages of the extant Hippocratic literature?

Cornford also imputes to the Hippocratics (39–42), and denies to the *physiologoi*, what he calls the "empirical theory of knowledge," i.e., the doctrine that all knowledge is derived from sensation. But this is not presented in any Greek text earlier than the *Phaedo* (96b 5–9),⁸ or any Hippocratic text other than *Precepts*, Ch. 1—which is so unmistakably Epicurean in both thought and language that it is worthless as evidence of a doctrine held by the physicians independently of, and in opposition to, the *physiologoi*.⁹ Aside from this, all that we find in the Hippocratics are the assumptions that the senses provide trustworthy cognitive data and that both thought and sensation are physical processes and thus depend on the physical state of the organism and its interaction with its physical environment. What is here that cannot be matched in the *physiologoi*? Alcmaeon's doctrine that the senses are "channels" (*poroi*) of understanding, so far from expressing a theory of knowledge hostile to that of the natural philosophers, is so congenial to them that it is

Littre 8,584,3) to refer to a cosmological theory which the author employs to explain the nature of man

⁶ L. Bourgey, *Observation et expérience chez les médecins de la collection Hippocratique* (Paris, 1953), 135.

⁷ P. 38. For a survey of the records of experiments in the Hippocratics, he refers to W. A. Heidel, *Hippocratic Medicine* (New York, 1941). He takes no account of Heidel's earlier book, *The Heroic Age of Greek Science* (Baltimore, 1931); a study of the chapter on "Experimentation" in this book, which covers instances in the historians and philosophers as well as the physicians, might have given Cornford a more balanced view of the subject.

⁸ Cornford says that "the author of this doctrine is known to be none other than the physician Alcmaeon" (41). All we can certainly ascribe to Alcmaeon on the basis of opinions explicitly referred to him (A5–10) is the doctrine that the brain is the seat of sensation; we may infer that he held that the brain is also the seat of thought, since physical disturbances of the brain impair not only sensation (to which Alcmaeon referred to establish the connection of sensation with the brain, Theophr., *De sensu* 26) but also thought. There is nothing in the testimonia to establish that Alcmaeon taught that knowledge is the end product of a process which begins with sensation from which come memory and *doxa* and then, finally, through the "stabilization" of memory and *doxa*, results in knowledge.

⁹ Cf. W.H.S. Jones, *Hippocrates*, I (London, 1923), 306; L. Bourgey, *Observation et expérience*, p. 40 and n. 6. Cornford is misled by Heidel, *Hippocratic Medicine*, p. 73 and n. 43, who remarks that "there is nothing in it that may not well have been said by any thoughtful Greek at the middle of the fifth century"; Heidel's references (*Dialektics*, Ch. 9; *Phaedo* 96a–b) simply do not bear him out.

immediately assimilated by Empedocles in the *On Nature* (B2; cf. A36. 8). That none of them asserts an [empiristic] [empiricist] theory of knowledge does not convict them of discounting the value of experience as a source of knowledge; the very contrary is implied in their view that "the intelligence of men grows according to what is present (to them)."¹⁰

Cornford identifies quite correctly a doctrine of knowledge which would be certainly anti-empirical: that of *anamnēsis*. Now the only [69] philosophers to whom this can be imputed before Plato are the Pythagoreans and Empedocles in the *Katharmoi*; it can only be found in just those phases of pre-Socratic thought which are inspired by a theological dogma absolutely foreign to the *physiologoi*. Cornford wisely refrains from fathering *anamnēsis* on the natural philosophers. But he argues that "the reason itself, in which the philosopher trusted, had inherited its claim to immediate and certain apprehension of truth from the prophetic faculty of the inspired sage" (159). The concept of "inheritance" in this context is so vague as to be almost meaningless. What sense is there, for instance, in the contention that Heraclitus is a "successor" of the shaman? Certainly he believed that the reason of the philosopher is consubstantial with the reason of the universe, that the wise man can, and must, understand the "*gnomē* which steers all things through all things." But if, as Cornford admits (116n.1), Heraclitus was not an Orphic, and hence could not believe in any kind of knowledge derived from transmigration, what is there in his doctrine to match, or even approach, the shaman's claim that his spirit could wander throughout the universe to gather wisdom inaccessible to the senses and reasoning-powers of embodied spirits? Parmenides seems to come closer to this pattern: "his journey to, or round, the heavens"¹¹ recalls the heaven-journey of the shaman's ritual drama" (118). But though Parmenides does present his doctrine in the guise of a religious revelation, he does not rest his claim to its truth on supernatural inspiration. His goddess does not say, "Believe," but, {"Judge by reason"} (*krinai logōi*, B7.5), appealing to an austere logical demonstration, whose cogency is wholly rational; this is the

¹⁰ Emp. B 106. Philosophers from whom one would expect a depreciation of sense-experience, like Heraclitus, surprise one by asserting just the opposite. Cf. B1: the common experience of men, he believes, exemplifies the truths of his doctrine, and the trouble with the common view is that ἀπειροὶ λογισμοί, ἀπειροὶ λόγοι, καὶ ἴσχυος καὶ ἐγγύος τοῦ αὐτοῦ, so too at B16 (reading οὐκ οὐκ ἐγγύος τοῦ αὐτοῦ) and B72. So too his saying that "eyes are more exact witnesses than ears" (B101a) for the interpretation see von Fritz, "Nóos, Noēm and Their Derivatives in Pre-Socratic Philosophy" (Part I) *CP* 40, 1945: 234. Emp. B2 must be understood in the light of Heracl. B1: the trouble with the experience of the common run of men is that it is too narrow, fleeting, and distraught—this kind of experience *thaōtos* (A. 7) cannot reveal to eye, ear, or mind the truth about the world.

¹¹ "Round the heavens" is not in B1, nor even (strictly) "to the heavens"; the journey is *kata panti asti* and then to the "gates of the ways of Night and Day" wherever these may be, our only clue to their location is the Hesiodic model (*Th* 744), which puts them at the "sources and limits" of Earth, Tartarus, Sea, and Sky, which must be under the earth (see below, n. 20).

exact opposite of shamanism. Consider finally the case of Epicurus. Cornford pounces on the *epibolē dianoias* which, following Bailey,¹² he translates "projection of the mind," with special reference to Lucretius (2, 1047) *animi iactus liber*, and comments: "The Epicurean falls back upon a metaphor whose original meaning was that the mind has the power of escaping from the body and ranging at will on a flight into the unseen world" (30). But there is absolutely nothing to show that this was the "original meaning" of *epibolē dianoias*; *epibolē* was never applied to mental functions, so far as we know, by anyone before Epicurus. And even if it had been, it would not prove at all that this was the meaning intended by Epicurus, any more than, e.g., one who uses the term *substance* nowadays need do so with any [70] reference to its original, Aristotelian sense. Had Cornford studied Epicurus' own use of *epibolē*, he would have seen that, so far from suggesting shamanistic detachment from the body, the term is employed in the crucial passages of just that mental function which concentrates thinking on the precise image which is "stamped" upon the mind in sensation;¹³ *epibolē* is not a lapse from Epicurus' exaggerated empiricism, but an assertion of it.

¹² *The Greek Atomists and Epicurus*, (Oxford, 1928), 559ff. In all fairness to Bailey, he should not be charged with the view Cornford gets out of him, since Bailey recognizes, indeed stresses (p. 563), that *epibolē* is used of the senses no less than of the mind: from this it would surely follow that the term cannot mean anything like even a metaphorical "escape" from the body, which would be absolutely senseless in the case of *epibolē dianoias*.

¹³ So at *Ep. ad Hdt.* 50 and 51. [At 50 the *phantasia* which we get ἐπιβλητικῶς τῇ διανοίᾳ ἢ τοῖς αἰσθητικοῖς is the image which has been stamped (*enaposphegiasato*, 49) upon our mind; to get it *epiblētikōs* is to apply the mind or sense to just this image, without going beyond it to a *prosoдохασμενον*. Similarly at 51 ἐπιβολαὶ διανοίας ἢ τῶν λοιπῶν κριτηρίων are acts of mind, sense, or feeling, which keep to the sensible copies of the "existent and real" things, abstaining from any associated (*sunēmmenēn*) motion, which deviates (*dialēpsin echousan*) from the immediate sense-datum. There is no difference at 69; the accidents of shape, color, size, etc. have their *epibolas . . . idias*, as well as their *dialēpseis*; *epibolai* refer again to sensible impressions, since all these accidents are κατὰ τὴν αἴσθησιν αὐτὴν γνωστά, and *epibolai* are (as at 51) contrasted with *dialēpseis*. None of the other passages in Epicurus contribute anything that changes this primary sense of *epibolē*. It is used only metaphorically at 35 and 36, *supos* and *puknōma*, whose basic reference is, of course, to the *eidōla* and their deposit on the soul (cf. 49 and 50), are here transferred respectively to the summaries of the master's doctrine and their deposit on the mind; *epibolē*, by like extension, is transferred to the undeviating application of the mind to these doctrinal summaries (without any heretical *dialēpseis*). Nor is Lucretius' understanding of the term any different. *Animi iactus liber* at 2, 1047 (and the emended text, *inice mentem*, at 2, 1080) are clearly metaphorical. The single instance where *animi iniectus* is used nonmetaphorically shows that the term is used in exactly the same sense as in Epicurus, you can know by *epibolē dianoias* that there are colorless bodies, says Lucretius, and proves it by the fact that these are perceived *tactu* by the blind and by the rest of us in the dark; *epibolē dianoias* is once again the application of the mind to a sensible (here, tactile) image. I say all this because, quite apart from Cornford's extravagant notions on this topic, neither Bailey's extensive discussion nor its critique by N. W. DeWitt ("Epicurus, *Peri phantasias*," *TAPA* 70 [1939], 414ff.) bring out this rather elementary point.]

But if Cornford were persuaded to give up the shamanistic "inheritance" of the *physiologoi*, he would still retort: "But are they not all rationalists? Is not their cosmology in every case a 'dogmatic structure based on a priori premises'" (159)?—It is perfectly true that pre-Socratic *physiologia* rests on a priori premises, e.g., that the world results from the diversification of an originally undifferentiated state (the Milesians, Empedocles, Anaxagoras, the atomists); that nature is a realm of intelligible order (*dikē* for Anaximander, *anankē-dikē* for Parmenides, bare *anankē* for the atomists); that unalterable being persists throughout every process (Parmenides, Empedocles, Anaxagoras, the atomists). Without one or more of these premises, none of which can be reckoned as mere empirical generalizations, every pre-Socratic cosmology would collapse. But it is false to count the employment of such assumptions as evidence of hostility, or even indifference, to empirical inquiry. Had the pre-Socratics reached a greater degree of philosophical sophistication, they might very well have argued that some a priori premises are the logical prerequisites of all scientific investigation. Since it would be [71] obviously anachronistic to expect them to argue in this way, what we must ask is whether their rationalistic assumptions did imply in their own case any hostility to the use of sensory observation. The answer, surely, is that it did not. The injunction of Empedocles in *On Nature* (B3, 9–13) to use eye, ear, tongue, and every other sensory "channel of understanding" is one with which every one of the *physiologoi* would concur.¹⁴ Their general attitude is well expressed in Heraclitus' dictum, that "eyes and ears are bad witnesses for men who have barbarian souls" (B107); i.e., the senses themselves tell no lies; their testimony is truthful enough, if only the mind has wit enough to judge it correctly. Even Democritus' doctrine that sense-experience is "bastard" knowledge does not imply the slightest hostility to its use for natural inquiry. The point of the doctrine is, of course, the denial that material bodies have "secondary qualities," which may be good or bad philosophy but is not inspired by, nor does it prompt, any depreciation of sensory observation in scientific inquiry: the founders of modern science, Galileo, Descartes, Boyle, Newton, held exactly the same doctrine. Democritus himself was an indefatigable investigator of natural, and even technological,¹⁵ problems, where data would necessarily be supplied by the senses.

¹⁴ Empedocles would not even have troubled to assert this axiomatic assumption had it not been denied by Parmenides (B7.2–5). Yet Parmenides himself would accept it when he turned from the investigation of Being to *physiologia*, the theory of knowledge appropriate to the latter identified thought with the *krasis meleōn* (B16); *meleu* here = *gustare* in Emp. B3, 13, i.e., the physical organism, including, of course, the sense-organs.

¹⁵ A point which needs to be stressed against Cornford's view that the natural philosophers had no interest in the control of nature (43). The list of Democritus' writings includes *Peri Geōgraphiēs* B3.71–78, and several works on applied science or the arts (*Ἐκπερασματα*: 11a, *Θαυματογραφίᾳ*, 14b; *Γεωγραφίᾳ*, 14c; *Πολογραφίᾳ*, 15a; *Ἀκτινογραφίᾳ*, 15b; *Περὶ Ζωγραφίᾳς*, 28a; *Περὶ Ῥυθμῶν καὶ ἁρμονίᾳς*, 15c, medical essays, 26b c.d.).

To locate that feature of Greek *physiologia* which did obstruct empirical inquiry, Cornford should have focused attention not on its theoretical load of *a priori* premises, nor even on its tolerance for generalizations which outrun observable fact, but on something quite different. That a natural theory should be an imaginative construct, rather than a mere record of detailed observations, is not a vice in empirical science but the reverse;¹⁶ this is exactly what a scientific theory ought to do, *provided* that it is formulated as a hypothesis testable by further observation. The vice of pre-Socratic theories of nature is precisely that they fail to conform to this proviso. All too frequently they are so loose in texture that it is hard to see how any relevant observation could either confirm or refute them. The conflicting claims of their general theories of the constitution of matter could not be adjudicated by observation: there is not [72] a single observed or currently observable fact to which, e.g., Democritus could appeal to decide in favor of this theory against that of Anaxagoras or Empedocles.¹⁷ Even their more specific theories are for the most part undecidable by observation. Obvious as this may seem, Cornford shows little appreciation of it. Thus he thinks that Empedocles' theory of respiration "could have been tested by anyone who would sit in a bath up to his neck in water and observe whether any air bubbles passed into, or out of, his chest as he breathed" (6). But what is there in Empedocles' theory to imply that minute quantities of air passing through water out of (or into!) one's chest would cause bubbles? Nothing at all; bubbles or no bubbles, the theory would survive the bath experiment.

This is a relatively minor instance of the point at issue. One could find far more important cases where one would expect that known facts, or assumed facts, would clash with accepted theories, only to see, on second thoughts, that the clash would never be felt as such because of the vagueness of the theory. Thus even a child would know that earth or stones could be heated to a point far exceeding the normal temperature of water or air, so that they could actually ignite combustible substances in direct contact with them. Would not this contradict the theory which held its own for over a century in Ionia (Anaximenes, Diogenes) that hot bodies are formed by rarefaction, cold ones by condensation? So it would seem at first sight. But a closer look at the theory will show that there is nothing in it to require its proponents to admit that this phenomenon was contradictory of it. The theory is not cast in the form of a strict functional variation of temperature and density, comparable, e.g., to the

inverse ratio of temperature and volume of gasses in Boyle's Law. All that it says is that the hottest body, fire, resulted from the rarefaction of air, while successive degrees of condensation produced wind, vapor, water,¹⁸ earth, and stones. So stated it is undisturbed by any number of all-too-obvious facts, such that air, which is vastly rarer than earth, has normally much the same temperature as earth and does not need to be shaken in the least by the fact that earth can be both extremely hot and extremely dense at the same time. The theory does not exclude the possibility that while the temperature of air should correspond quite closely to its density (Anaximenes B1), the temperature of others, like earth and rocks, should not. There is no *a priori* reason why earth and rocks, though very cold when first formed, should not be susceptible of high degrees of subsequent heating without impairment to their solidity. [73]

If we are to understand why the *physiologoi*, in spite of their eagerness to use the senses for all they were worth, failed not only to use, but even to understand, the experimental method of modern science, we should focus attention on the form of their theories which made them such clumsy instruments of empirical research, as well, of course, as on the primitive state of their observational techniques, which forced them to rely so largely on qualitative data, unrefined by quantitative measurement. Cornford ignores this area of investigation in this book because he is much too preoccupied with his favorite theme of the religious origins of Greek cosmology. He wants to show that it was unempirical and unscientific, *because* its dominant concepts were derived not from "innocent observation of Nature" (197) but from antecedent religious beliefs. But just what do these derivations come to? Simply to the notion that great masses of the physical universe—Earth, Sea, Sky, Air—arose from an undifferentiated primal state, i.e., the first, and only the first, of the *a priori* premises I enumerated above (p. 119). This can be found in Hesiod's *Theogony*, though only in that passage which Cornford strangely enough completely ignores: that remarkable venture into cosmography at verses 736ff., where the "sources and boundaries" of Earth, airy Tartarus, Sea, and Sky are located "all in a row" in Chaos.¹⁹ Whether these lines were written by Hesiod himself, or by a later poet, the one thing that is certain is that they depict a conception not only different from, but quite incompatible with, the story of verses 116–32: The latter, as Cornford himself observes (195), does "not say that Earth was born of Chaos, but that Earth came into being 'thereafter'": he might have added that they tell us that Uranos and Pontos are born of the Earth, which cannot be reconciled with the teaching of 736ff. that they stem directly from Chaos itself. If Cornford is to make a case for a pre-philosophical cosmology "already far advanced along the road to complete

¹⁶ Cf. Claude Bernard: "Of necessity we experiment with a preconceived idea," *Introduction to the Study of Experimental Medicine* (English translation, New York, 1927), p. 22

¹⁷ Anaxagoras' question "How could hair come from that which is not hair, and flesh from that which is not flesh?" (B10) is not at all an appeal to fact but an assertion of an *a priori* principle, *sc.* that no substance could arise from, or perish into, any substance qualitatively different from itself. The facts of nutrition could be "explained" by Empedoclean or atomistic theory as much (or as little) as by that of Anaxagoras

¹⁸ A5 and 7 (3). Simplicius and Hippolytus, following Theophrastus. Cf. Diogenes A5.6 9

¹⁹ See F. Solmsen, "Chaos and *Apeiron*," *Studi italiani* N.S. 24 (1950), 235ff.; H. Fränkel, *Dichtung und Philosophie des frühen Griechentums* (New York, 1951), 148–49

rationalization" (225), he should have looked to just these lines, which are, in my opinion, by far the most likely source of Anaximander's *apeiron*.²⁰ But note how far short of "complete rationalization" they [74] fall. When he gets to these "limits" of the universe, the poet who wrote these verses feels that he also reached the limits of reason—and not only of human reason; the gods themselves "shudder" at these limits, find them an "awful marvel." For Anaximander, on the other hand, the *archē* of the visible universe is not only intelligible in itself as a mixture of the physical opposites which compose the world but is the source of the intelligible order of this world, its "governor," the guarantee of its "justice."²¹

Cornford does not intend to depreciate the unique achievement of "Ionian rationalism":

It was an extraordinary feat to dissipate the haze of myth from the origins of the world and of life. The Milesians pushed back to the very beginning of things the operation of processes so familiar as a shower of rain. It made the formation of the world no longer a supernatural, but a natural event. Thanks to the Ionians, and to no one else, this has become the universal premiss of all modern science. (187–88)

²⁰ The word, *apeiron*, is, of course, not directly applied to Chaos in the *Theogony*. But note the following similarities with Anaximander's *apeiron*:

1. The immensity of its size: "you would not reach its bottom even in a whole year that brings completion," vv. 740–41; cf. Solmsen, "Chaos and *Apeiron*," 247 (Cornford, 176ff., doubts that "infinite extension" is implied in Anaximander's *apeiron*, though for no good reason, but even if not strictly infinite, it would be vast enough. Cornford also thinks that it was "conceived as spherical in shape," 176–77, for which there is no reason at all: the fact that round things are spoken of as *apeira* by the poets does not imply that all unlimited things are conceived as round.)

2. that it is the source of Earth, Sky, Sea, and Air;

3. that it is thought of as agitated by squalls (*thuelia*, v. 742)—Anaximander's *apeiron* is also (eternally) in motion, A11(2), 12.

4. its immortality, indestructibility, is implied, since it is the source and boundary of Earth, Sky, etc., all immortal gods; moreover, *Thespesion* at v. 700 could also be construed as an epithet of Chaos (cf. Solmsen, "Chaos and *Apeiron*," 237). Had Cornford paid attention to vv. 735ff., or even to vv. 720ff., he would not have made the mistake of imputing to Hesiod (194ff.) the latter notion that Chaos is the "yawning gap" between heaven and earth," which does not make sense at verse 116 (how could Chaos come into being as a gap between two things that don't yet exist?), and is contradicted by verses 727–31 (the *eschata gaiēs* are, where the Titans are imprisoned, obviously under the earth) and by verses 736ff. (how could the sources of Tartarus be above the earth?). Even verse 700 (on which Cornford depends) does not strictly imply that the Chaos is between Heaven and Earth, the poet may only be saying that the great conflagration spread from Earth and Sea to their nethermost sources and beyond, as the din of the theomachia at *Iliad* 20, 56ff., which shook earth and sea, reached down as far as Hades to frighten its king.

²¹ For my interpretation of Anaximander, see ("Equality and Justice in Early Greek Cosmologies") *CP* 42 (1947), 168ff. (**1.74ff.)

He might have added that the very concept of nature, as a domain of unitary, necessary, and intelligible order, was their own creation, and that to this extent they may rightly be regarded as the creators of the scientific worldview, in spite of the fact that they failed to understand and use the experimental method. When we have made full allowance for the unscientific form of so many of their theories, we must still give them credit for laying the conceptual foundations on which, nearly two millennia later, more skillful hands than theirs, equipped with better tools, intellectual and technological, could build the enduring edifice of natural science. This was their great bequest to the intellectual heritage of mankind, and this they did not derive from religious sources. If there were any sources for this at all, they were not religious but political, a topic to which Cornford never alludes in this book. In the work of his youth, *From Religion to Philosophy*, he had been fully alive to the social origins of Greek philosophical ideas but had made the mistake of looking for them in the remote antecedents of private tribal life instead of the contemporary experience of the democratic polis. Elsewhere I have suggested that it is just this political experience which furnished the pre-Socratics with the conceptual pattern which they applied to the comprehension of nature [75] as a rule of law, an autonomous, self-regulative system, whose orderly "justice" was guaranteed by the assumed "equality" of its components.²²

²² ("Isonomia") *AJP* 74 (1953), 361ff. (**1.107ff.)

ON HERACLITUS

I OFFER HERE remarks on (a) the authenticity of the whole or part of some of Heraclitus' fragments (Section I), and (b) the historical relation of his thought to that of those who influenced him most directly, Anaximander and Anaximenes (Section II).¹ The immediate stimulus for these reflections I owe to the study of G. S. Kirk's recent book, *Heraclitus: The Cosmic Fragments*, which I reviewed briefly in the July 1955 issue of the *American Journal of Philology*. A work as serious and thorough as this compels one to reconsider many things one has previously taken for granted, to ask new questions, look afresh at the texts, and push through to a finish some hitherto half-finished trains of thought. For this I must express my sincere thanks to Kirk and also the hope that he will see in my many criticisms of his views a mark of esteem, not [337] the reverse. Only a fundamental work is worthy of extensive criticism. And if I have said little on matters in which I agree with him, it is because I could not hope to improve on his own treatment of them.

I

I start with the river-fragments. In Diels-Kranz they read:

B 91a. ποταμῷ . . . οὐκ ἔστιν ἐμβῆναι δις τῷ αὐτῷ.

B 49a: ποταμοῖς τοῖς αὐτοῖς ἐμβαίνομέν τε καὶ οὐκ ἐμβαίνομεν, ἐλμέν τε καὶ οὐκ ἐλμεν.

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¹ After completing the first draft of this paper, I had the benefit of comments on it by Professor Friedrich Solmsen and of a detailed discussion of the fragments of Heraclitus made by Professor Harold Cherniss in his seminar at Princeton (Spring Term, 1955). I learned much from both and made many revisions and corrections accordingly. But it must not be inferred that either or both of them would share all the views I express here. I alone am responsible for any opinion not credited by name to another. With two minor exceptions, I have not even undertaken to *mention* the interesting suggestions put forward by Professor Cherniss in his seminar: original ideas are better presented to the public by their originator, and I hope he may publish them himself. I also wish to thank the Institute for Advanced Study for enabling me to pursue studies on this and other topics under ideal conditions during the past year.

B 12: ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμβαίνουσιν ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ.²

The first is the most famous of the sayings attributed to Heraclitus since the time of Plato. The latter's citation (*Crat.*, 402a) reads: οὐκ ἂν ἐμβαίης for οὐκ ἔστιν ἐμβῆναι in Aristotle (*Met.*, 1010a14) and Plutarch.³ I believe that Plato's more direct form, in the second person optative in place of the infinitive, [338] is more likely to be the original.⁴ The second fragment expresses in its first sentence much the same thought as that conveyed by B91a in a different, though equally arresting, form. Both fragments are now in peril of their lives. Reinhardt has rejected the first; Gigon, and now Kirk, reject also the second, leaving us with B12 as the single original.⁵ But I have no intention of bidding these old friends good-bye without strong reasons. And Kirk has really none for condemning the first, except the following: While Plutarch cites B91a twice in almost the same form (see Kirk, p. 372), he has a third citation (at *Qu. nat.*, 912a) which reads: ποταμοῖς γὰρ δις τοῖς αὐτοῖς οὐκ ἂν ἐμβαίης, ὥς φησιν Ἡράκλειτος, ἕτερα γὰρ ἐπιρρεῖ ὕδατα. Kirk assumes that the latter must be derived from an original identical with B12, and that Plutarch's first two citations (as well as Plato's and Aristotle's) can only be

² The sequel, καὶ ψυχὰς δὲ ἀπὸ τῶν ὑγρῶν ἀναθυμιάωνται, is printed in the fragment by Diels-Kranz, but with a sceptical question-mark. The main reasons for rejecting it are noticed by Kirk (*Heraclitus*, pp. 368, 371 (hereafter to be referred to by the author's name only)). But we would be in a better position to solve the residual puzzle, *sc.* why Cleanthes (cf. Kirk, p. 367) should have connected the river-image with the soul, if we adopt (following a suggestion made by Cherniss in his seminar) an emendation proposed by J. D. Meewaldt (*Mnemosyne*, 4 [1951], pp. 53–54), νεαπαὶ for νεοπαὶ in the sentence preceding the citation, which would then run, "For Heraclitus, wishing to show that souls by being exhaled become ever new (νεαπαὶ), likened them to rivers, saying, etc." Thus Cleanthes would have linked the soul with *anathumiasis* (perhaps as Kirk suggests at p. 371, by means of B36 *sub fin.*) and then soul-in-*anathumiasis* with the river-image by means of the ceaseless change characteristic of exhalation. A still more complete explanation for Cleanthes' treatment of the fragment would be available if, as I shall argue below, B49a should be retained. (May I say here, once for all, that I shall not burden the text by references to the ancient sources of quoted fragments, except where these are essential for my argument; the sources are easily found in Diels-Kranz or, better still, in Kirk, who also gives more of their context. In referring to Kirk's opinions, I shall not give page-references except when his excellent index of the fragments, pp. vii–ix, is insufficient to identify the passage.)

³ *De E.* 392b, from which B91 is taken by Diels-Kranz, and also in Plutarch, to which I shall refer and quote in the text below. Plato's οὐκ ἂν ἐμβαίης is retained.

⁴ Cf. οὐκ ἂν ἐξεύροιο at B45, which is sufficient to dispose of Reinhardt's opinion ("Heraclitis Lehre vom Feuer," *Hermes* 77 [1942], p. 18n.2) that the second person optative "niemals Heraklitisch sein kann," echoed by Kirk (p. 372). To this article by Reinhardt I shall hereafter refer merely by the author's name.

⁵ Reinhardt, *loc. cit.* and *Parmenides* (Bonn, 1916), pp. 165 and 207n.1; O. Gigon, *Untersuchungen zu Heraklit* (Leipzig, 1935), pp. 106ff. Cf. also E. Weerts, *Heraklit und Herakliteer* (Berlin, 1926), pp. 8ff. I shall focus on Kirk's discussion, which conserves most of the objections that have been raised against B91a and 49a.

variants of B12. But let us compare the first clause in Plutarch's third citation (a) with B91a and (b) with the first part of B12. In the case of (a), the difference is trivial: "rivers" in the plural in place of "river."⁶ In the case of (b), the difference is anything but trivial: Plutarch's says, "one cannot enter *twice*," while B12 "to those who enter." The presence of *dis* in the earliest version of the Heraclitean saying is attested not only by the Platonic citation to which I referred above, but, more strongly, by the context of Aristotle's version of the fragment (*Met.*, 1010a13): "Cratylus scolded Heraclitus for having said one could not step into the same river twice; for *he* thought one could not even once." In his book Kirk does not question the authenticity of Cratylus' remark.⁷ But, if authentic, it could not have been a [339] retort to B12, which does not contain the vital *dis*. How could it then be directed at anything but a saying which did say "twice," as Gigon and Reinhardt have already observed? Are we to suppose that Cratylus first invented the powerful image conveyed by "twice" (as in inference from B12?) and then made his own creation the epitome of the Heraclitean doctrine to which he objected? Or shall we think he got it from some other secondhand source? In the absence of definite evidence to the contrary, we can only assume that an image worthy of Heraclitus' genius was his own creation, not that of an imitator or paraphraser. But if *dis* was in the original, it could obviously not have been in the first part of B12, while the second part of B12, unobjectionable in itself, could very well have been taken from an original, which read, δις ἐς τὸν αὐτὸν ποταμὸν οὐκ ἂν ἐμβαίης, ἕτερα γὰρ καὶ ἕτερα ὕδατα ἐπιρρεῖ. This is substantially Plutarch's third citation⁸ and, in the light of the foregoing considerations, our best reconstruction of the Heraclitean original from which both B91a and B12 were derived.

⁶ There is also, of course, οὐκ ἂν ἐμβαίης for οὐκ ἔστιν ἐμβῆναι, but this would only strengthen the conclusion I reach below if the former is the original, as I have already suggested.

⁷ He did so in an earlier paper ("The Problem of Cratylus," *AJP* 72 [1951], pp. 225–53 at pp. 244–48). He started here by pointing out the similarity between Aristotle's citation and Plato's (*Crat.*, 402a 9–10), as though this were any reason for thinking that Aristotle is only quoting Plato and Plato is misquoting Heraclitus. Then, catching up with the *non sequitur*, he negated the possibility that both Plato and Aristotle are quoting a genuine fragment by referring to Reinhardt's opinion that B12 is the original quotation from Heraclitus and then "confirming" Reinhardt's view by referring to Plutarch. In all this there is nothing to discredit the authenticity of Cratylus' remark as reported by Aristotle, unless we assume the very point at issue, *sc.* the genuineness of B12 and spuriousness of B91a; nor is there anything in Reinhardt (*loc. cit.*) except the scornful aside, "Was bei Aristoteles steht, ist nicht Zitat, sondern Anekdote."

⁸ But I have kept the text in Plato's citation for the first part of the fragment, on the rule that the earlier citation should be favored in the absence of definite reasons to the contrary. For Plato's ἐλθὲν in place of the dative in Plutarch's third citation, cf. ἐλθὲν πάλιν ἐν ἑαυτῷ at B5. Plutarch himself has the accusative with εἰς in one of his three citations (*De sera num.*, 559c). Both forms were in use (LSJ, s.v. ἐμβαίνειν); Heraclitus' use of the accusative with ἐς in this fragment and of the dative in B49a presents no difficulty.

What of Kirk's case against B49a? His objection to the first sentence is that it "is not a possible summary of anything Heraclitus said, for it asserts that *at any moment* the rivers are the same and not the same: thus, as Aristotle tells us, is the belief [340] not of Heraclitus but of Cratylus, αὐτὸς γὰρ ᾤετο οὐδ' ἄπαξ" (p. 373).⁹ Now if we are to press such fine points, we might as well be exact about it. If Cratylus' remark is to be recast into a retort against B49a, it would have to assert not, as this does, both alternatives, "we do, and do not, enter," but just one of them, "we do not enter." So the difference between the two views would remain intact, Heraclitus asserting identity-in-difference in B49a, Cratylus difference (without identity) in his remodeled rejoinder. So the difference from Heraclitus would remain intact. The only question, then, is whether Heraclitus would be unlikely to express identity-in-difference in a yes-and-no form. To this the answer is certainly no. Kirk rightly cites the parallel of οὐκ ἐθέλει καὶ ἐθέλει at B32. He might also have noticed here the ὅλα καὶ οὐχ ὅλα in B10. These prove that Heraclitus did use the paradoxical yes-and-no form of expression, for which there is no known precedent, though it turns up after him both in his imitators¹⁰ and in his great critic, Parmenides¹¹—a form which is the perfect vehicle for his paradox that things [341] which not only appear to be, but are, different are nevertheless "one"

⁹ An objection first made by Gigon, *Untersuchungen*, p. 107, and approved by Calogero, *Giornale critico della filosofia italiana* 17 (1936), p. 215n.1

¹⁰ (Hippocr.) *De victu*, I, 4, πάντα πρὸς ἑκάστον τωτό, καὶ οὐδὲν πάντων τωτό. I, 5, πάντα ταῦτα καὶ οὐ ταῦτα, I, 24, οἱ αὐτοὶ ἐσέρπουσι καὶ ἐξέρπουσι καὶ οὐχ οἱ αὐτοί . . . τὸν αὐτὸν μὴ εἶναι τὸν αὐτόν. *De nutr.*, 17, μία φύσις ἐστὶ πάντα καὶ οὐ μία, 24, μία φύσις εἶναι καὶ μὴ εἶναι, 25, μέγεθος αὐτῶν μέγα καὶ οὐ μέγα, 27, γλυκὴ καὶ οὐ γλυκὴ, 32, δύναμις μία καὶ οὐ μία, 42, οὐκ ἐστὶ καὶ ἐστὶ. For most of the passages from *De nutr.* I am indebted to Reinhardt, *Hermes* 77 (1942), p. 239. For the same idiom in Euripides, cf. *El.*, 1230, φίλα τε καὶ φίλα, *Bacch.*, 395, τὸ σοφὸν οὐ σοφία, *Or.*, 819, τὸ καλὸν οὐ καλόν, *Hel.*, 138, τεθνᾶσι καὶ τεθνᾶσι, *Alc.*, 521, ἐστὶν τε καὶ οὐκ ἐστὶν; and Eurip. parodied by Aristoph., *Ach.*, 396, οὐκ ἔνδον, ἔνδον ἐστίν.

¹¹ B6, 8–9. Those who deny any allusion to Heraclitus in Parmenides (and they are now in the great majority) have yet to explain why in these lines Parmenides should (a) impute to *anyone* the belief in the identity of being and not-being (rather than merely the belief in not-being, which is bad enough from his point of view and would have given his critical dialectic all the scope it needs) and (b) after saying οἷς τὸ πλεῖν τε καὶ οὐκ εἶναι ταῦτόν νενομίσταται here, which would be quite sufficient to make his point, should add maliciously, καὶ ταῦτόν, producing the expression ταῦτόν καὶ ταῦτόν, which so strikingly parallels ὅλα καὶ οὐχ ὅλα in Heraclitus; nor (c) why he should be so emphatic in asserting that each of the two forms in his cosmology is ἐαυτοῦ πάντοσε τωτόν, τῷ δ' ἐτέρῳ μὴ τωτόν, B8, 57–58 (on the latter cf. "Parmenides' Theory of Knowledge," *TAPA* 77 [1946], p. 69n.21 [*1.156n.21]; and how Kirk, p. 2). As other allusions to Heraclitus, we can count (d) παλίντροπος at B6, 10, if, as I shall argue, the same word must be retained at Her., B51; also (e) the parallel of σκιδνῆσι . . . συνίσταται at Her., B91 with σκιδνόμενον . . . συνιστάμενον at Parm., B4 (which is ironically strengthened by Reinhardt's rehabilitation—now followed by Walzer and Kirk—of the genuineness of συνίσταται in the Heraclitean fragment, against its rejection by Diels-Kranz and others, to the defense of συνίσταται I should add Heraclitus' use of διίσταται at B125).

and "the same." Nothing would be more natural for a man who thinks and talks this way than to say, of the same rivers whose waters are never the same at any point, "we step into the same rivers—and we don't step into the same rivers." What of the next sentence, εἰμέν τε καὶ οὐκ εἰμεν? Surely one does not need to see "him through the eyes of Hegel" (Kirk, p. 373) to suppose that he *could* have said just that. The idea of our being and not being would be a true application of Heraclitus' notion of the identity of opposites and neither more or less Hegelian than the identity of the living and the dead at B 88. Heraclitus was as capable of saying εἰμέν τε καὶ οὐκ εἰμεν, as Euripides ἐστὶν τε καὶ οὐκ ἐστὶν, *Alc.*, 521. But is he likely to have said so in *this* fragment? This is the real problem, for admittedly the transition from "into the same river we do and do not enter" to "we are and are not" is abrupt. It is possible that some part of the original dropped out, for our source for this fragment, Heraclitus Homericus, omits important words in two of his other citations of Heraclitus.¹² If so, the simplest explanation would be that the original read εἰμέν τε καὶ οὐκ εἰμεν (οἱ αὐτοί).¹³ But this is by no means the only reasonable hypothesis. [342] There is nothing to preclude the possibility that the εἰμεν was existential, and that Heraclitus passed in this fragment (with or without intervening words) from the "yes-and-no" of our relation to external objects (the rivers, as symbols of change) to the "yes-and-no" of our own (changing) being.¹⁴

My conclusion as to the relative claims to authenticity of the three river-

In the case of B90, all he gives us is πυρὸς . . . ἀμοιβή τὰ πάντα, *Quest. Homer.*, 43, πυρὸς καὶ πῦρ ἀπάντων; of ἀπτόμενον μέτρα καὶ ἀπτοβεννόμενον μέτρα in the last case of B30 only ἀπτόμενον τε καὶ οὐκ οὐκ βεννόμενον survives in *ibid.*, 26. No omissions in the case of B62, though his text (*ibid.*, 24) is obviously not as good as that of Hippolytus.

¹³ Zeller-Nestle, *Philosophie der Griechen*, I (2) (Leipzig, 1929), p. 798n., suppose that οἱ αὐτοί (or ἐν τοῖς αὐτοῖς ποταμοῖς), though not in the original, was meant to be supplied from the preceding οἱ αὐτοί. Though I do not think these suggestions "absurd" (so Kirk, p. 373), neither can I put any stock in them in the absence of any appropriate parallels.

¹⁴ Other objections to B49a are also put forward by Kirk, following Gigon (*Untersuchungen*). The use of the first person plural to represent an action which is not necessary or universal (in contrast, for example, with fr. 21) is improbable in archaic prose style; and it is extremely unlikely that the *embaimontes* (who provide the fixed point of observation in fr. 12) should be put on a level with the waters which change" (p. 373). Why is the latter "unlikely"? Doesn't Heraclitus think that men change as much? Why then should he not "put them on a level" with the changing rivers? And the truth expressed by the verbs surely *is* universal (what else could it be?); so there is no problem about the plural, though I am not convinced that there would be even if it were not universal. Curiously enough Kirk does not bring up the most serious difficulty in the way of the genuineness of the latter part of B49a: εἰμέν τε καὶ οὐκ εἰμεν are just the words that would have been most likely to be quoted by Cleanthes (n. 2, above) or by Seneca (Ep. 58, 23), who see the river as a likeness of human change. The only explanation I can offer is to assume that the first part was separated from the second in some important source and thus came alone to the notice of Cleanthes and Seneca, cf. the fate of B90, whose first part, πυρὸς τε ἀνταμοιβή τὰ πάντα, is cited all by itself (with variations) over and over again (ten citations listed by Walzer, *Eracito*, Florence, 1939), pp. 125–26), while only Plutarch preserves the whole fragment.

fragments is thus the opposite of Kirk's. In one thing I do agree with him: we cannot keep all three; for though Heraclitus may well have used the river-image more than once, he is unlikely to have done so without significant variation in thought and expression. But the one I would sacrifice is B12, for it is the flattest of the three and can be better explained as a smoothing down of B91a (or rather of the variant I have suggested above) and B49a, than can the latter as subsequent remodelings of a weaker Heraclitean original.¹⁵ Another solution of the problem would be to take Seneca's version as the [343] original of the first part of B49a: *in idem flumen bis descendimus et non descendimus* (Ep., 58, 23).¹⁶ But I think this goes to the other extreme from B12. Seneca is bound to have both of the gems that fell out of B12, and both in the same sentence. But either of them—"do not enter twice" or "we enter and do not enter"—tells the whole story perfectly all by itself. To put them together makes a crowded pattern, redundant, and less lucid. Its taste (or, rather, lack of it) is much more likely to be that of Seneca than Heraclitus.¹⁷

I shall next review the case of B89, τοῖς ἐγγηγορόσιν ἕνα καὶ κοινὸν κόσμον εἶναι, τῶν δὲ κοιμωμένων ἕκαστον εἰς ἴδιον ἀποστρέφασθαι. Diels, followed by Kranz, had already condemned the second clause, for no good reason: the use of *koimōmenōn* is no objection, for, as Kirk points out (p. 64) *koimasthai*, a common word from Homer down, is perfectly possible instead of *katheudein*, *heudein* in B1, B12, B26, B75, B88. Kirk thinks the whole fragment "a later paraphrase, partly of the last clause of fr. 2 [ζῶνουσιν οἱ πολλοὶ ὡς ἰδίαν ἔχοντες φρόνησιν] and partly of the last sentence of fr. 1 [τοὺς δὲ ἄλλους ἀνθρώπους λανθάνει ὁκόσα ἐγεγρήντες ποιοῦσιν, ὁκωσπερ ὁκόσα εὐδοντες ἐπιλανθάνονται]" (p. 63). But surely there is no mere paraphrase here. B1 speaks of failing to notice or take account of what happens in our waking experience, while B89 of turning away from "the one and common world" to a "private" one; this in turn is a different idea from that of the *logos xynos* vs. *idia phronēsis* B2, though the senses of all three are, of course, very closely related. If we are to throw out this fragment, it cannot be on the ground that it merely repeats what is said in the other two, but that the distinctive thing it does say could not have been said by Heraclitus. And why not? Because, says Kirk, the word *kosmos* could only mean "order," not "world," at this time (p. 63). He argues this at length in his

¹⁵ I have misgivings about dropping even B12. It has its own peculiar stylistic beauty, best noticed by H. Fränkel, who speaks of its "wie rastlose Wellen herabflutende Kola," *Göt. Nachr.* (1925), p. 107n.2. Yet neither does it have the rugged strength of Heraclitus. To rely on the contrast between ποταμοῖσι τοῖσιν αὐτοῖσιν and ἕτερά καὶ ἕτερα ὕδατα to get across the idea of change would be good enough for other writers, but milder than what one expects from Heraclitus—and what gets in B91a and B49a.

¹⁶ Defended as a translation of a Heraclitean original by Calogero (n 9, above).

¹⁷ Reinhardt *loc. cit.*, objected to Seneca's version on the ground that *dis* would not go with the plural. But I fail to see that *dis ouk embainomen* would make poor sense or impossible Greek.

commentary on B30, κόσμον τόνδε, τὸν αὐτὸν ἀπάντων, οὔτε τις θεῶν οὔτε ἀνθρώπων ἐποίησεν [344] etc., to condemn *ton auton hapantiōn* as a gloss.¹⁸ He collects the uses of *kosmos* in the pre-Socratics, and says, quite rightly, that ὁ κόσμος ὁ πρόσθεν ἑὸν in Melissus, B7, and *kata kosmon* in Parmenides, B4, can only mean "order" and "in order" respectively. But he is wrong in saying that in Anaxagoras B8, οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἐνὶ κόσμῳ, κόσμος, *kosmos* is "the one group, or category—in this case, probably the continuum formed by each pair of opposites" (p. 313). Anaxagoras does not say here that the hot and the cold "form" a *kosmos*, but that they are "in" one; his *kosmos* is indeed a continuum, but a single one, wherein "everything has a portion of everything," not the many continua of his multiple pairs of opposites, which would not be "one world." Kirk is also wrong in saying that in Diogenes of Apollonia, B2, εἰ γὰρ τὰ ἐν τῷδε τῷ κόσμῳ ἑόντα νῦν, γῆ καὶ ὕδωρ καὶ ἀήρ καὶ πῦρ καὶ τὰ ἄλλα ὅσα φαίνεται ἐν τῷδε τῷ κόσμῳ ἑόντα, the expression *en tōide tōi kosmōi* means "'in this arrangement' (as opposed to a primaeval mixture)" (p. 313), because the notion of a primaeval mixture has nothing to do with what Diogenes is talking about here and cannot be, as an implied contrast, the clue to the sense; he is just talking about the world of ordinary experience and the various things in it. He is finally wrong in saying that Xenophon, *Mem.*, I, 1, 11, ὁ καλούμενος ὑπὸ τῶν σοφιστῶν κόσμος and Plato, *Gorg.*, 597e, οἱ σοφοὶ . . . τὸ ὅλον τοῦτο . . . κόσμον καλοῦσι "suggest very strongly that *kosmos* = world is a comparatively new and technical usage" (p. 314); I italicize "new" because that, of course, is the only thing to which I object; the point of both texts is that it is the philosophers who call the world *kosmos*, not that they have started doing this fairly recently.¹⁹ Moreover this [345] very fragment of Heraclitus

¹⁸ Following Reinhardt, pp. 12–13, whose arguments are (a) that the words are only in Clement, but not in Plutarch or Simplicius (quoting Alexander), (b) "the same for all things" does not make good sense here and the sense it does make ("*Totalität*") is anyhow implied by the assertion of the eternity of the world in the sequel. But (a) lacks cogency, since only Clement cites the rest of the fragment in its entirety, while the other two give only pieces of it; (b) becomes irrelevant if one translates, "the same of all men" (see n. 21, below), which makes excellent sense: the world which "no one of gods or men has made" or could make is "this one," the real world, which is "the same of all"; "private" dreamworlds (cf. B89) can be and are being made all the time.

On the other hand, I should agree with Kirk (p. 312) against Reinhardt, Kranz ("Kosmos als philosophischer Begriff frühgriechischer Zeit," *Philologus* 93 (1938–39), pp. 430–48), and Gigon, that Theophrastus' phrase τοὺς οὐρανοὺς καὶ τοὺς ἐν αὐτοῖς κόσμους is of itself no evidence for the use of the word by Anaximander; and that the authenticity of ὅλον τὸν κόσμον in Anaximenes, B2 (to be discussed below) is far from certain. But I am not as confident as Kirk that *kosmos* was not used even in sixth-century speculation for "world." In his extended defense of early usage, Kranz, *ibid.*, makes no mention of this consideration: the Milesians would certainly need a substantive by which to refer both in the singular and the plural to the world(s) which issue from the *archē*. Adjectival and participial makeshifts like τὸ ὅλον, τὸ πᾶν, τὰ πάντα, τὰ ἑόντα would not formally distinguish world(s) from *archē* or, if they did, would only convey the idea of indefinite totalities instead of structured world-systems. *Ouranos*, some-

(B30) is evidence that *kosmos*, though it implies, does not just mean, "order," for what is in question here is not merely that nobody made the *order* of the world, but that nobody made this *orderly world*; this world is fire, and nobody made the fire, for it is "ever-living."²⁰ Kirk, in spite of his theory, concedes as much when he is led to say in the course of his discussion of the fragment that "the relationship of *kosmon tonde* to *pur aeizōon* becomes, after all, one of simple predication: the natural world and the order in it . . . is an ever-living fire" (p. 317). "Natural world and the order in it"—this is the sense of *kosmos* in Heraclitus, B30 and B89, Anaxagoras, B8, and Diogenes, B2. Then the argument that it can only mean "order" for Heraclitus is pointless, as it is certainly wrong anyhow.

There is then no reason why Heraclitus could not have spoken of "this world, *the same of all*" in B30,²¹ and in B89 of the [346] "one and common world" for the wide awake from which sleepers turn away, each to his own "private (world)." The notion of the real world being "the same of all," "one and common" for all, is a powerful one. It fills out beautifully Heraclitus' idea that the *Logos*, though common, is missed by the many (B2) and passes unnoticed, though ever-present and universal (B1). It says explicitly what is implied in B17, which says that the many don't understand the things they "meet with" (reading *ὁκόσοις ἐγκυρεῦσιν*): the world is what we all "meet with" all the time, it is the very same for all of us, but those who cannot understand its order live as though not only their understanding (B2), but their world (B89), were private, like men asleep. Homer had already spoken of the *dēmos oneirōn*, *Od.* 24.12, and for him, as for everyone, dream, like shadow, was the symbol of unreality, the land where only phantoms dwell. Heraclitus underlines the unreality of the dreamworld by calling it "private."²² At the same time he shows up the illusory character of ordinary belief by

times used by Aristotle, Theophrastus, and the doxographers for just this purpose, is never used in this way in extant fragments (*Parm.*, B10, 5, *Emp.*, B22, 2) but always, as we should expect, in its original sense of "heavens." Such a need is bound to be met sooner or later, and more likely sooner than later; it could be met very early by the use of *kosmos* since the notion of the world as an orderly arrangement was, of course, present from the beginning. For this reason (not Kirk's p. 313) I am inclined to discount *Aët.*, II, 1, 1, "Pythagoras was the first to name τὴν τῶν ὄλων περιόχην 'world' because of its order."

²⁰ Cf. Burnet's comment: "*kosmos* must mean 'world' here, not merely 'order'; for only the world could be identified with fire," *Early Greek Philosophy* (4th ed., London, 1945), p. 134n.3.

²¹ The usual translation of *ἀπάντων* here is "for all" (so DK, Burnet, Kirk), as though Heraclitus had written *πάνσι*. The difference in sense between the genitive and the dative is probably not great, but we might as well observe it in the translation, with "of all" here and at B114, τῷ ξυνὸν πάντων, and "for all" at B113, ξυνὸν, *πάνσι*, and "for the wide awake" at B89, τοῖς ἐγρηγορόσι.

²² Cf. E. R. Dodds, *The Greeks and the Irrational* (Berkeley, 1951), p. 118. "Not only does that rule out the 'objective' dream, but it seems by implication to deny validity to dream-experience in general, since Heraclitus' rule is 'to follow what we have in common'."

banishing it into a world as "private" as that of the dream. In developing this line of thought, Heraclitus would run up against the paradox that the beliefs which he condemns as "private" were in fact the general rule and thus perfectly "common" in that sense, while his were, in the same sense, all too "private" to himself. To block this sidetrack, he would wish to say somewhere along the line that the "common" is not the common-run, nor the individual the "private"; what is "common for all" is not what all, or almost all, happen to think, but what all should think, and would, if they had sense. So B113, ξυνὸν ἐστὶ *πάνσι* τὸ φρονεῖν, has a distinctive place in his train of thought, and I see no reason for dropping it because of Kirk's suspicions.²³ [347]

I now turn to two cases which involve a change in the received text. First the famous B51, which reads in Diels-Kranz, οὐ ξυνιάσιν ὅπως διαφερόμενον ἐωυτῷ ὁμολογέει. παλίντροπος ἁρμονίῃ ὅπως τὸ ξου καὶ λύρης. Kirk, with Zeller, Brieger, Gigon, Verdenius, and Walzer, would change *homologeēi* to *sumpheretai*, after Plato, *Symp.*, 187a, τὸ ἐν γὰρ φησι διαφερόμενον αὐτὸ αὐτῷ συμφέρεσθαι ὥστερ ἁρμονίαν τόξου τε καὶ λύρας, and by analogy with συμφέρομενον διαφερόμενον in B10. With this change I would agree.²⁴ But I cannot join Kirk (and an impressive list of other scholars)²⁵ in dropping *palintropos* in favor of *palintonos*. My reasons for conserving *palintropos* are partly those of Diels and Kranz (*DK*⁶, *ad loc.*, pp. 162 and 493): (a) Plutarch has *palintropos* in one citation (1026b), *palintonos* in a second (369b), while in a third (473f) one of the MSS gives *-tonos* and all the others *-tropos*, and Porphyry, *De antr. nymph.*, 29, has *palintonos*. But none of these are complete citations of the fragment; only Hippolytus gives the whole fragment, and he reads *palintropos*; moreover he cites it along with a raft of other complete fragments, which makes it pretty certain that he had a book, or excerpt, of Heraclitus before him, which is most unlikely in the case of Plutarch's and Porphyry's citations. (b) Given the repeated (five times) *palintonon* as an epithet for *toxos* (or *toxa*) in Homer, it is certainly the *lectio*

²³ They come to this: for Heraclitus "common" was "almost a technical term" whose "primary" sense was "operative in all things"; but in B113 it has the "subsidiary" sense of what (or how) all should think; and "one may well doubt whether Heraclitus would have explicitly used *κινῆσι* in this subsidiary sense where some other expression would have done equally well" (pp. 55–56). But what is the good of doubting this, when *κινῆσι* is so used in B2 and B114, in both of them with the sense of a norm which all should follow—a sense which surely has the closest connection with that which, I agree with Kirk, is the primary one.

²⁴ Mainly for the reasons given by Kirk on p. 205. Hippolytus' text for Heraclitean fragments is generally excellent, and one departs from it at one's peril. But in this case, there is a plausible explanation for a mistake (by Hippolytus or a copyist) in the occurrence of *ὁμολογέει* (also *ὁμολογουσιν*) just before the fragment (Kirk, p. 204), and in the MS reading *ὁμολογέειν*, whose final *nu* strongly suggests repetition of the preceding *ὁμολογέειν*.

²⁵ Kirk (p. 211) refers to Brieger, Burnet, and Walzer. I add Snell (*Hermes* 76 [1941], p. 86n.1), Verdenius (*Parmenides* [Groningen, 1942], p. 78), H. Fränkel (*Dichtung und Philosophie des frühen Griechentums* [New York, 1951], p. 482).

facilior for any later citation of Heraclitus' fragment. (c) Theophrastus' διὰ τῆς ἐναντιοτροπῆς ἡρμόσθαι (*apud* Diog. Laert., 9, 7) is a clear [348] variant for *palintropos harmonia*. Kirk's objections (p. 211) that this depends "upon his (Theophrastus') physical interpretation" of B60, ὁδὸς ἄνω κάτω μία καὶ ὀνύτη, is irrelevant: even if this interpretation of B60 were mistaken (and I do not think that it is),²⁶ it would not explain why Theophrastus should invent a word not modeled on Heraclitus to convey his mistake. I offer finally this further reason against *palintonos*: *tonos*, in the sense of "tension" that would be needed here, does not occur in any Heraclitean fragment, nor in any pre-Socratic fragment in a physical context; nor does *teinein* with this sense, but always²⁷ with the sense of "extending." There is much talk of "tension" in Kirk's and others' interpretations of Heraclitus,²⁸ but none of it is grounded textually on anything but the disputed *palintonos* in B51. As everyone knows, tension was a key concept for the Stoics, and if they could have pinned it on their patron they would have surely done so; this is itself another reason why *palintonos* would be likely to displace *palintropos* in the postclassical era. *Tropē*, on the other hand, is an important word and concept for Heraclitus, as we know from B31, where indeed the sense of *palintropos* is strongly conveyed: fire "turns" to sea, but half the sea turns back again to fire *prēstēr*.²⁹ [349] On these grounds it appears to me that the evidence is overwhelmingly on the side of *palintropos*.³⁰ The only question then is whether it makes good sense. (i) Does *palintropos harmoniē* make a fitting description of the Heraclitean cosmos? (ii) Does it apply to the bow and the lyre in the simile?

²⁶ Kirk, following Reinhardt, takes it "as a relativistic statement devoid of physical application" (p. 109). But the arguments against the physical interpretation are weak. Its misapplication to the *ekpurōsis* by Diog. Laert. 9, 8 proves nothing. Nor does its use by Tertullian, Philo, and the neo-Platonists to express other ideas foreign to Heraclitus (for the references see Kirk, p. 106), a recurrent fate of Heraclitus' sayings. As Kirk duly remarks (p. 107), in "the commonest ancient interpretation . . . the 'way up and down' represents the cosmological changes of matter between fire, water, and earth, as in fr. 31." There is absolutely nothing to forbid this connection with B31, whose sense B60 fits perfectly, and much to recommend it, for thereby the primary reference of this assertion of the unity-identity of opposites becomes a cosmological phenomenon of the highest importance instead of a banality, like the sameness of the road that goes uphill and downhill, adopted in all seriousness by Kirk and others.

²⁷ Empedocles, Diogenes, perhaps Parmenides, see DK⁶, Wort-Index, s.v.

²⁸ Ironically, even proponents of *palintropos* fall into the same way of talking. Diels translated "gegenstrebig," having perhaps forgotten he had translated *tonos amph' uretēs*, Xenoph., B1, 20, as "das Streben um die Tugend." Kranz also slips into "Gegenstrebigkeit" while elucidating *palintropos*, *Hermes* 69 (1934), p. 118n.1.

²⁹ It might have been even in the text of the closely following B31b, which Kranz would now begin with (πάλιν δὲ γῆ). DK⁶, I, p. 493.

³⁰ I have not mentioned *palintropos* at Parm., B6, 9 which Diels considered decisive all by itself (*Herakleitos* [Berlin, 1901], p. 13), for it would not be right to argue that Parmenides' use of it here is an allusion to Heraclitus unless its use by Heraclitus can be established on independent grounds.

I should have thought there could be no possible doubt in anyone's mind as to (i). But I gather from Kirk that there is more than doubt in his.³¹ So I had better go into the matter briefly: The primary sense of *palin* is "back"; hence, by easy extension, "reverse" or "opposite" (so Kirk, p. 215). So *palintropos* would be literally "back-turning," "changing in the opposite direction," or more broadly, just "contrary" (LSJ, s.v. II. 1, 2). As for *harmoniē*, its sense is what we would expect of the abstract for *harmozō*, which is "to fit, adapt, accommodate"; its denotation is broad enough to cover a ship's joint, a medical suture, a covenant, a betrothal, a government, a musical scale or concord (LSJ, s.v.). Burnet's "attunement" is too narrow as a translation of *harmoniē* in this fragment; it will not fit the bow. Conversely, Kirk's "connection" is too loose; "adjustment" would be better. Now Heraclitus' world is all adjustment, and of a kind which is not only compatible with contrariety but can only exist through the latter; and since it is all in change, the contrariety it exhibits is that of changes proceeding in opposite directions (e.g., B10, B126). So there would be plenty of scope here for *palintropos* in its most general [350] sense of "contrary." But we need not stop with this. Let us note that in the Heraclitean scheme any one thing following a given line of change will be found to turn in the opposite way sooner or later; and that this "back-turning" is necessary to preserve the inter-adjustment of this changing thing with other changing things. Think, for example, of some water on the "upward" path. Whatever parts of it continued on this path would have to double back when they became fire; only by doing so could they remain within the system of "exchanges" (B90) that maintains the order of the world; and the only "exchange" in which fire can be involved is with water, hence "downwards." Thus the *harmoniē* of the Heraclitean world is *palintropos* in the most specific and definite sense.

What of (ii)? There are two possibilities here, depending on the reference of *harmoniē*: If this is to the *framework* of the bow and the lyre (a perfectly good sense of *harmoniē*, LSJ, s.v. I. 4), then *palintropos* must refer to their shape, i.e., to the fact that the two arms turn away from each other at the center. The only trouble with this is that it would make for a static image, not in keeping with the *harmoniē* of the Heraclitean universe which is as dynamic as anything could be and is elsewhere appropriately illustrated by burning spices (B67), gold coin in circulation (B90), stirred barley-drink (B125). To get a comparably dynamic image out of bow and lyre, we must assume that *harmoniē*

³¹ Pp. 212–14. The conclusion he reaches is that "*palintropos* cannot well describe a *harmoniē*, and is indeed probably not used during the fifth century in any sense which could conceivably be attached to the fragment" (p. 214). I suspect confusion here, for there is a sense in which what Kirk says is true but irrelevant. Certainly, to the general public, indeed to almost anyone but Heraclitus, *palintropos* would seem the last thing any *harmoniē* could possibly be. But would not the general public find *diapheromenon* . . . *sumpheretai* an equally incongruous coupling? Is this a good reason why Heraclitus should not have used the latter, or the former?

niē refers to their *modus operandi*. This is indeed *palintropos*, for bow and lyre do their work, send forth arrow or sound, at just that moment when the process of stretching the string is reversed. The continuous application of effort in the same direction would not produce this effect. No arrow would fly, no sound would be heard, without "back-turning."³² [351]

Finally I must consider what Kirk does with B41, which reads in Diels-Kranz, ἐν τῷ σοφόν, ἐπίστασθαι γνώμην, ὅτῃ ἐκυβέρνῃσῃ πάντα διὰ πάντων. Kirk would punctuate strongly after γνώμην, taking ἐπίστασθαι γνώμην with Heidel (and Gigon) as a periphrasis for γιγνώσκειν; and he would read ὅκη κυβερνᾶται after γνώμην. Now κυβερνᾶται is unobjectionable; something must be done with κυβερνήσαι or ἐγκυβερνήσαι of the MSS, which does not make sense, and Bywater's κυβερνᾶται will do as well

³² An identical interpretation of the simile was offered by A. Brieger (*Hermes* 39 [1904], pp. 198-99), following closely upon Susenhihl

Die Bogensehne wird nach der Brust zurückgezogen . . . und dann losgelassen, und das Resultat dieser beiden entgegengesetzten Bewegungen ist der Flug des Pfeils. Wie beim Schiessen, handelt es sich auch beim Leierspiel um zwei entgegengesetzte Bewegungen. die Saiten wird durch den Schlag des Plektrons zurückgedrängt und schnell wieder in ihre ursprüngliche Lage vor, und das Resultat ist der Ton. Den beiden Werkzeugen, deren Fügung durch Zurück-schnellen den betreffenden Effect bewirkt, wird mit Recht eine "zurückschnellende Fügung," *palintonos harmoniē* beigelegt

I have cited this at such length because of its admirable lucidity and complete success in sustaining the consistency of the simile in bow and lyre alike—neither of which can be said of the much better known version of this interpretation, the one offered by Wilamowitz, in *Griechisches Lesebuch*, II, 2 (Berlin, 1902), p. 129, and again (with some changes) in *Platon* (4th ed., Berlin, 1948), p. 287n 2. The only odd thing in the citation from Brieger is in the surprise that awaits one at the end, one would never have thought he was doing anything but glossing and even translating *palintropos*! "Bewegung" is intolerably loose for *tonos*, and "zurückschnellende" would be just right for *palintropos*. L. Campbell (who read *palintonos*) paraphrased (*The Theaetetus of Plato* [2nd ed., Oxford, 1883], p. 244), "As the arrow leaves the string, the hands are pulling opposite ways to each other, and to the different parts of the bow (cp. Plato, *Rep.* 439), and the sweet note of the lyre is due to similar tension and retention"; in the latter sentence the reference of "retention" is unintelligible, in the former (often echoed by others), the account is strictly false: the hands are no longer "pulling opposite ways," etc. "as the arrow leaves the string." Kirk's own gloss on *palintonos* (which he translates, "working in both directions"), "the string is being pulled outwards towards its ends and the arms of the frame are being pulled inwards towards each other" (p. 215), is possible, but open to two objections: (i) since, as he duly notes, pp. 213-14, *palintonos*, as applied to the bow in the epic and currently, was used of the unstrung, as much as of the strung, weapon, its primary reference must have been to its shape, (ii) if *tonos* in *palintonos* were used with the sense of "tension," the *palin* would be redundant, since, as Kirk himself remarks, "any kind of tension must work in both directions" (p. 215), and Heraclitus is not the sort of writer who says the same thing twice over in a single word. If one must have *palintonos*, one would do better to follow Macchiore (known to me only through Kirk, p. 216), who "takes it as meaning 'alternatively stretching,' and refers it to the alternate tension and relaxation of the string" (Kirk, *loc. cit.*) Kirk's objection—that the present tense of *sumpheretai* in the preceding sentence precludes alternating tensions in this one—seems to me irrelevant

as any of the proposed emendations.³³ Ὅκη for ὅτῃ would fit much better [352] Heidel's interpretation of ἐπίστασθαι γνώμην.³⁴ But why should Heraclitus, who is hardly the man to use two words where one will do, say ἐπίστασθαι γνώμην if ἐπίστασθαι or γιγνώσκειν is what he means? Heidel's reason for this was that a γνώμη governing all things is a Stoic concept; with this, says Kirk (p. 388), "I entirely agree," and adds that "the name of the possessor of the γνώμη would have to be added, as in, for example, Pindar, *Pyth.* 5.122ff., Διὸς τοι νόος μέγας κυβερνᾷ δαίμον' ἀνδρῶν φίλων." But is the subject of Logos supplied in τοῦ λόγου δ' ἔόντος ξυνού at B2 or in τοῦ λόγου ἀκούσαντες at B50? Naturally, if asked, "Whose *gnōmē* or *logos* are you talking about?" he would reply, "that of the ever-living fire." But the implied distinction would not have been a matter of reflective attention for him. If anything is foreign to Heraclitus, it is the conceptual disjunction of the substantival and the adjectival. As Kirk knows very well, this sort of discrimination takes a long time to find its feet in Greek philosophy; being is both existential and predicative in Parmenides, and the hot, cold, etc. in the pre-Socratics are not just qualities but, as Cornford used to call them, quality-things. It would be wholly characteristic of this period to merge thought and thinking things,³⁵ and change freely from "the thunderbolt (which) steers all things," B64, to "the thought by which all things are steered." To whom could this give offence, except someone who would take the latter to imply a disembodied, incorporeal mind, as no one would at this time?³⁶ [353]

II

A prime requisite of the historical interpretation of any philosopher, ancient or modern, is to determine the nexus with those of his contemporaries or predecessors who did the most both to supply him with a working-stock of basic

³³ And if taken with ὅτῃ (following Deichgraber, *Philologus* 93 [1938], p. 14 and n. 5, who compares ὅτῃ at B15) would surely make our best text for the fragment, ὅτῃ κυβερνᾶται is closer to the MS readings (ὅτῃ κυβερνήσαι P¹ B, ὅτ' ἐγκυβερνήσαι F) than ἢ (Bywater) or ὀπη/ὄκη (Gigon) or ὅκη (Kirk) κυβερνᾶται. Diels's ἐκυβέρνῃσῃ is open to Kirk's well-taken objection "his gnomēic aorist is inappropriate, since the action is strictly continuous" (pp. 387-88)

³⁴ It would iron out the strange inconsistency in Heidel who, after denouncing as "Stoic" the notion of a thought that governs the world, went right ahead to translate, "she (Understanding) it . . . that pervades all things and governs all things," *PAA* 48 (1913), pp. 700-702.

³⁵ And even both of these with their object, *cognoscens* with *cognoscendum*; cf. (my "Equality and Justice in Early Greek Cosmologies") *CP*, 42 (1947), p. 177 and n. 180 (**1 87 and n.180)

Thus Xenophanes says only that his "one god" is οὐτὶ δέμας θνητοῖσιν ὁμοῖος οὐδὲ νοῦμα, B23, he does not think of saying that he has *noēma* but no *demas*, which would have served infinitely better his polemic against anthropomorphism.

concepts and also to provoke new questions in his own mind, calling for new answers and therewith new concepts. Who are the most likely candidates for the role in the case of Heraclitus?

A proper answer to this question would call for a much more extensive investigation than I could carry out in this paper. All I can do here is to propound a *hypothesis*, and follow it out, in the hope that the results so obtained will commend it to others. It is that the main historical influences on Heraclitus' thought were the great Milesians, Anaximander and Anaximenes, and that our best chance to understand the problems which confronted him and the meaning of his own answers to them is to discover as best we can the links which connect his thought with theirs. Though, I repeat, this is only a hypothesis, it is only fair to add that it is not an implausible one. For think of the suggested alternatives: Parmenides, Xenophanes, Pythagoras. Each of the first two has found powerful exponents, but with results disproportionate to the resources expended on either hypothesis. Reinhardt's brilliant sponsorship of the view that Heraclitus' "roots" are in Parmenides was condemned to failure at the start by the indefensible chronology on which it was based.³⁷ Gigon's attempt to link him with Xenophanes³⁸ sheds some light on Heraclitus' religious views but almost none on his cosmological and metaphysical conceptions. As for Pythagoras, [354] he is easily the candidate least likely to succeed, since what we know of his doctrine is so meager in itself, almost infinitesimal in comparison to what we know of Heraclitus; how can our ignorance of the former improve our knowledge of the latter?³⁹ So by a process of

³⁷ For the most recent criticism of his chronology, see Kirk, pp. 1–3. That in spite of this mistake Reinhardt's work has done so much to stimulate Heraclitean studies in the last forty years is a tribute to the vigor of his thinking, the incisiveness of his writing, and the breadth of his knowledge. The same qualities make his later papers (to the first of which I shall continue to refer), "Heraclitus' Lehre vom Feuer," and "Heraclitus," *Hermes* 77 (1942), pp. 1ff. and 225ff., outstanding contributions.

³⁸ *Untersuchungen* (above, n.5). For a critique of his theory of Heraclitus' dependence on Xenophanes, see W. Brücker, review of O. Gigon, *Untersuchungen*, and of F. J. Brecht, *Heraclitus*, *Gnomon* 13 (1937), pp. 530ff. Though only a doctoral dissertation, Gigon's is a challenging book, and Kirk has done well to devote so much time to the detailed discussions of its views.

³⁹ If this sounds unduly pessimistic, consider the possible borrowings: (I) *metron* (so Kirk, p. 403). But did this figure in the Pythagorean scheme? We don't know. Our evidence, such as it is, speaks of *peras* (in opposition to *apeiron*), not *metron*. But suppose *metron* was used as an alternate to *peras*; it would then refer, like the latter, to (a) ratios of odd-even numbers such as those of the concordant musical intervals (cf. (my review of Raven's *Pythagoreans and Eleatics*) *Gnomon* 25 [1953], pp. 33–34 (**1 180–88) and/or (b) whole integers, applied to things like justice, the soul, etc. (Arist., *Met.*, 985b 29–31 and Ross (*Aristotle's Metaphysics*, vol. I [Oxford, 1924]) *ad loc.*). Where does Heraclitus employ ratios as at (a) or numbers as at (b) in any comparable way? (II) *logos*. What is there analogous to either (a) or (b) in Heraclitus when he speaks of *logos*, e.g., at B1 or B31b? A more interesting suggestion has come from Fränkel, "A Thought Pattern in Heraclitus," *AJP*, 59 (1938), pp. 309–37 and Minar, "The Logos of Heraclitus," *CP*, 34 (1939), 323–41, at pp. 338ff., who take the sense of *logos* borrowed from

elimination, one is led back to the Milesians, where one should have started anyway. That Heraclitus knew their books has high antecedent probability, and is confirmed, quite apart from all the things I shall discuss below, by some meteorological details in which he followed them.⁴⁰ That he [355] had plenty of respect for them we may assume from the fact that they never figure in his vitriolic broadsides against prominent contemporaries and predecessors (B40, B42, B56, B57, B81). To be known and not abused by a man of Heraclitus' temperament is tantamount to the receipt of a certificate of merit.

Of B80, εἰδέναι δὲ χρὴ τὸν πόλεμον ἔδντα ξυνόν, καὶ δίκην ἔριν, καὶ γινόμενα πάντα κατ' ἔριν καὶ χρεῶν, ["one must know that war is common, and right (*dikē*) is strife, and that all things come to pass by strife and necessity (*chreōn*),"] Kirk rightly remarks that it is "almost certainly a criticism of Anaximander" (p. 401). Both *dikē* and [*kata*] *chreōn* occur also in Anaximander's famous fragment; and the thrice repeated reference to "war/strife" could hardly fail to allude to Anaximander's notion of the mutual aggression of the elements.⁴¹ But what is the criticism? Kirk's answer—that

Pythagoras to be "proportional mean," i.e., the $X:Y :: Y:Z$ ratio. But though a convincing case has been made by Fränkel for Heraclitus' use of this "thought-pattern," there is no evidence that he derived it from Pythagoras, whose use of it is purely conjectural, and, if historical, would not have endeared it to one who thought him a charlatan (B81). Moreover, though *any* proportion would be a *logos*, there is no evidence that when Heraclitus spoke of *the logos* or "the same *logos*" he was thinking of a proportional mean at all (cf. my elucidation of B31b in the text below, where the required relation is equality, not geometric proportion) nor, conversely, that when he did use the three-term proportion (e.g., at B83, *apeiron :: man:god*) he was thinking of this relation as a manifestation of what he called *logos*.

⁴⁰ His explanation of thunder-lightning is that of Anaximander as modified by Anaximenes (Aët., 3, 3, 1, 2, and 6): Anaximander explained this as a cloudburst; Anaximenes, likening the phenomenon to the "sea, which flashes when divided by the oars," added the notion of external impact (which could be only that of wind on cloud) as the cause of the rending of the cloud; Heraclitus' explanation of thunder has both wind-impact on cloud (ἐμπτύσεις πνευμάτων εἰς τὰ νέφη) and compression (*sustrophas*) of cloud by wind, and there is no reason to think that he offered a different explanation for lightning, as the confusing statement in Aëtius might suggest. His "bowls" theory of the heavenly bodies follows Anaximander in attempting to provide for containers of their fiery substance, altering the shape of the holders to suit the disk-shaped bodies postulated by Anaximenes. Heraclitus must also have known the physical theories of Xenophanes, but made only one important borrowing from them: the doctrine that "the sun is new every day" (B6), though this apparently meant for him that each day's sun is extinguished at night (Kirk, p. 267), while for Xenophanes it meant its "travelling on *ad infinitum*" (Aët., 2, 24, 9). An interesting linguistic link between Heraclitus and Anaximenes is pointed out by Reinhardt (p. 16), *diacheisthai* (Anaxim., A7, A8, Heracl., B31b).

⁴¹ For my interpretation of Anaximander, I must refer to my "Equality and Justice in Early Greek Cosmologies," *CP*, 43 (1947), pp. 168ff. (pp. 168–73 on Anaximander (**1 74ff. and 74–82)). Cf. also F. Dirlmeier, "Der Satz des Anaximandros," *Rhein. Mus.*, 87 (1938), pp. 376ff., K. Deichgräber, "Anaximander von Milet," *Hermes* 75 (1940), pp. 10ff., and H. Cherniss, "The Characteristics and Effects of Pre Socratic Philosophy," *JHI* 12 (1951), pp. 319ff. (pp. 323–28 on Anaximander).

while Anaximander held that "change between opposites involves a kind of injustice: on the contrary, *he* (Heraclitus) held that strife between opposites was 'the right way,' normal and just" (p. 240)—takes us part of the way toward the answer, but not the whole way. To begin with we must notice the enormous difference of the role which "strife" plays in Heraclitus: "All things happen in accordance with strife" (B80) "war is the father of *all* and king of *all*" (B53). What is only occasional and intermittent, though recurrent, in Anaximander, becomes universal and invariant in Heraclitus. Why [356] this difference? We cannot answer this question without granting the obvious implication of the river-fragments which Kirk formally denies (p. 367 *et passim*), the universality of change.⁴² That strife is universal follows from the assumption that whatever exists is in change with the added assumption that all change is strife, neither of them made by Anaximander. What happens now to the latter's conviction that the world is a realm of "justice"? Anaximander could hold, and did, that there is both "injustice" and "justice" in the world: strife being injustice, and justice consisting in the eventual reparation of the encroachments gained by strife. To Heraclitus this presented an intolerable compromise. Concluding as he did that strife is universal, he would have to infer that, if strife itself were unjust, there could be nothing but injustice. For him there could be no half-way house: either all is injustice or all is justice, in the physical world. He chose the second alternative, which he could only do by affirming, as he does in B80, that "strife *is* justice." The last clause of this fragment—that "all things happen in accordance with strife and rightful necessity"—is the completion of the thought which is affirmed in *each* of the preceding clauses.⁴³ [357]

Thus so far Heraclitus' thought is more intimately connected with Anaximander's than Kirk or any of the modern interpreters have recognized. Two of the fundamental ideas of Anaximander—that there is strife among the ele-

⁴² For my criticism, see my review of Kirk's book in the July issue of *AJP* (76, pp. 310–13).

⁴³ Kirk fails to see that *polemon . . . xunon* in the first makes the same point as *dikēn erin* in the second. He says that "in Homer and Archilochus Ares is described as impartial, but here war is said to be universal; this surely must be the sense in view of fr. 2 and 114 and of the description of war as father and king of all in fr. 53" (p. 241). But this misses (a) the perfect connection between the Homeric reference to war as *xunon* because "it kills the killer," *H.* 18, 309, and Heraclitus' *reason* for saying that strife is just (see the following paragraph in the text); (b) the fact that at B2 and B114 *xunon* does indeed have the sense of a *norm* (note 23, above), and (c) the fact that the same sense is even present at B53 which, of course, accents the universality of war in the strongest terms but also refers to its function as creator (*patēr*) and governor (*basileus*), a function which Heraclitus surely regards as just since he says that war establishes the distinction, unquestionably right for him, between gods and men, free and slave. Even the full significance of *dikēn erin* is not brought out by Kirk, for he makes no mention of usages of *eris*, *neikos* which would lend substance to their conception as instruments of justice (cf. the latter half of note 134, *CP*, 42 [1947], p. 170 [*1 77n.134]); and Fränkel's fine elucidation of B80 in *Dichtung und Philosophie* (above, n 25), pp. 481–82)

ments, and that a just order is *nevertheless* preserved—are reasserted in a form which universalizes both of them and thereby resolves the opposition between them: what is a "nevertheless" in Anaximander, becomes a "because" in Heraclitus. The result is that no part of nature *can* "overstep its measures," which is surely the point of B94,⁴⁴ and not, as Kirk takes it, that "long-term excess is punished (and reduced)" (p. 402), which is precisely what Anaximander had taught, not Heraclitus. There can be no excess at all, long-term, or short-term either, if "all things happen in accordance with strife and rightful necessity." But when we turn to the next question, "Why is justice preserved in strife?" we find that Heraclitus stands in a very different relation to Anaximander. For the maintenance of justice, the latter had relied immediately upon the equality of the elements. Now, as Kirk notes repeatedly, the notion of nature as an equilibrium of opposing forces does find a place in Heraclitus, though with the difference that the processes of encroachment and reparation are not successive, as in Anaximander, but concurrent: at every moment the main world-masses of fire, water, and earth are each giving up exactly as much as they take, each compensating constantly by the "death" they suffer (B36) for the one they inflict.⁴⁵ So much, I believe with Kirk, follows from B31a: "the turnings of fire are first sea, and of sea the half is earth, half *prēstēr*": the second clause can only mean that equal amounts of water are always turning back into fire and forward into earth, whence it would follow (a) that the total mass of water remains constant, consequently (b) that the total masses of fire and earth are also constant, since either of these can only change into or from water, and hence, for the same reason, (c) that fire and earth must also display the equipollence of change asserted of water in B31a—an inference [358] explicitly confirmed in the case of fire by the balancing expressions "kindling according to measures, and extinguished according to measures," in B30.

But note how short all this falls of preserving (let alone, extending) Anaximander's concept of equality as the guarantee of justice. For one thing, nothing is said to the effect that fire, water, and air are equal to one another. The assumption of the equality of the physical components of the world, reasserted by Parmenides and Empedocles, is quietly dropped by Heraclitus; for Anaximander's equilibrium of elements he substitutes an equilibrium of processes of change. And even the latter is only a special case of {"back-turning adjustment"} *palintropos harmoniē*. It applies only to those systems which do maintain themselves in a stable equilibrium. The world as a whole is such a system, and so is a river or, for that matter, the humblest candle-flame, so long as its mass remains constant. But many, indeed most, things within the

⁴⁴ As Reinhardt (*Hermes* 77 [1942], p. 244n.2) has remarked, *ei de mē* in this fragment "drückt eine Unmöglichkeit aus, einen Fall, der nie eintreten wird, wie in fr. 121: 'Und wenn, dann . . .,' worauf eine Negation folgt."

⁴⁵ Cf. above, note 43 (a)

world are not of this kind; there are rivers that dry up and flames that are put out. To uphold the justice of *all* strife, Heraclitus must fall back on another notion, more fundamental in his scheme than that of equipollent change: the constancy of a *logos* or *metron* preserved in all changes whatever. This is conveyed, in part, in B31*b*, whose sense is not correctly rendered by Kirk. "(Earth)⁴⁶ is dispersed as sea and is measured in the [359] same *logos* as existed before [it became earth]"⁴⁷ does not say or of itself imply that "sea is being constantly replenished by the liquefaction of earth proportionally with its diminution by condensation into earth" (p. 331). Heraclitus believes this, but it is not what he says *here*. What he does say is that any part of earth which becomes water has the same *logos* which it had before it had become earth, i.e., when a part of water, *w1*, becomes a part of earth, *e1*, and then *e1* changes back into a part of water, *w2*, then *w2* is "measured in the same *logos*" as *w1*, or *w2* = *w1*, for short.⁴⁸ B90, "all things are an exchange for fire, and fire for all things, as wares (are exchanged) for gold and gold (is exchanged) for all things," identifies fire as the thing that remains constant in

⁴⁶ I agree with Kranz, Kirk, and others that (γῆ) is justified by the probability that it was in the text followed by Theophrastus (πάλιν τε αὖ τὴν γῆν χεῖσθαι, Diog. Laert., 9, 9). This expansion is rejected by Walzer, Snell, Reinhardt (for the latter's defense, see p. 16n.1; and cf. note 48, below). I fail to see what is gained by dropping (γῆ) if θάλασσα διαχέεται is to be understood to mean, as by Reinhardt (*loc. cit.*) "the sea passes from a solid to a liquid state"; its "solid state" is earth, so we are right back to the meaning of (γῆ) but now without warrant from the text. If one is to forego the initial (γῆ), one should accept the only meaning which Clement's text will then permit, i.e., that the sea is dispersed as *fire*. This makes excellent sense, especially if taken in conjunction with the suggestion in the following note. For my part, I prefer to stick by (γῆ) on the probability that this was in the text known to Theophrastus. But nothing of any great consequence depends on this. The general conclusion I reach from my interpretation of B31*b* and B90 (toward the close of the paragraph in the text above) would be exactly the same if B31*b* referred to the change from sea to fire instead of from earth to sea.

⁴⁷ I am inclined to accept a suggestion made by Cherniss (in his seminar) and treat ἡ γενέσθαι γῆ as a gloss, its presence makes for unnecessary stylistic clumsiness, and its absence would make no difference to the sense; retaining (here contrary to Cherniss) the initial γῆ, the new text would still allow, indeed favor, the same reference of "before," *sc.* to the earth's antecedent liquid state. (But cf. also the following note.) Incidentally, I would argue that, if ἡ γενέσθαι γῆ is a gloss, it must have been put in by someone who did have an initial γῆ in his text: for, if he did not, it would have been natural to take θάλασσα as the subject, and, in that case, his gloss would probably have been ἡ γενέσθαι θάλασσα.

⁴⁸ Another possibility on the text suggested in the preceding note is that "before" refers to the earthy state before it turns into water, in which case it would be *e1* which is said to have the same *logos* as *w2*. A variant of this is permitted by the Diels text, *sc.* that the logical subject of *metreetai* is earth before it turns into sea, in which case the equation would be *e1* = *w1*. For obvious reasons, neither of these is as likely as the one suggested above, though the latter would avoid completely Reinhardt's objection (*loc. cit.*) that on the expansion (γῆ) "διαχέεται καὶ μετρέεται verschiedenes Subjekt erhalten," since the subject of *metreetai* (as well as *diacheetai*) would be *gē*. On the former interpretation here and that of my text above, *gē* would still be the grammatical subject of *metreetai*, but not the logical one; thus I do not find absurd, or even difficult, in this context

all transformations and implies that *its* measure is the same or common measure in all things. Thus, in the preceding instance, the same measure would obtain not only between *w1* and *w2*, but also between each of these and *e1*, and similarly between all previous transformations of which *w1* is the last and all subsequent transformations of which *w2* is the first, and in all cases for the same reason: each member of the [360] whole series represents the same amount of fire which is the common thing—to *xunon*—in all the different things that compose the series. Thus the ultimate guarantee of cosmic justice is fire: the invariance of *its* measures is what accounts for the observance of the *metron* in all things, and fire is therefore that which "governs" or "steers all things" (B41, B64, and n. 35, above).

Toward the end of his discussion of B90, Kirk remarks: "There remains one slight difficulty. . . . Fire is said to be an exchange for 'all things'; but fire itself must be one constituent of 'all things' . . ." (p. 348). There is indeed a difficulty: but is it "slight" and is it "simply due to an unavoidable looseness of speech" (*ibid.*)? If the trouble were merely verbal, Heraclitus could easily have avoided it by saying that {all *other* things} [πάντα (τὰ ἄλλα)] are an exchange for fire and fire {for all *other* things} [τῶν ἄλλων ἀπάντων]. The real difficulty is of quite another order. It is why Heraclitus should give to fire so unique and preeminent a place, when it is after all just one of three components of the cosmos whose mutual transformations are symmetrical. Why should not water or earth have as good a claim to the place of the "common," since either one of them becomes in due course each of the others? Indeed, why should any one of them be singled out as "common"? And why should the whole world be "ever-living *fire*"? Are not water and earth also "ever-living," each of them, like fire, everlastingly "living" and "dying"?⁴⁹ [361]

When Kirk faces up to this problem, he thinks he can solve it as follows: "The fire in question (in B30) is not simply that which burns in the hearth, because this has no claim to be more important or more primary than sea or

I cannot understand how the earth could be for Heraclitus "das Starre, Gegensatzlose, Tote" (W. Brucker above n.38), p. 532). How could anything be *gegensatzlos* in Heraclitus' world and fail to exemplify both terms of the polarities, change-stability, life-death? Kirk refers approvingly (p. 342) to the remark of H. Gomperz (review in *Gnomon* 13 (1937), 530ff.) that life, for Heraclitus, consists in passing from a more solid to a more fluid state while death is the reverse. His view is surely wrong as a generalization: take enough in the case of fire, it would be, e.g., *death* in the case of earth, for which it would be death to pass into the more fluid state of water. His more common view is that while Heraclitus would exempt nothing from change, he would not think of fire as changing more rapidly than anything else and (b) choose fire as his *archē* for the reason. We need not doubt that Heraclitus believed (a) — *e*, that the rate of "exchange" between fire and water is higher than of it at between water and earth, though he never says this. Nor do I think that (b) is wrong, though I do think it an incomplete answer to the question raised by the text above. Certainly fire makes a better *symbol* of permanence through change and life in death than does anything else. If he were only a poet, the superbly evocative power of this symbol would be an ample answer to my question.

earth. The cosmological fire must be thought of primarily as *aithēr*, that purer kind which in popular thought fills the upper region of the heavens and is considered to be divine and immortal" (p. 316). Whether popular thought at this time made this distinction between our fires and the fire of the celestial regions, we do not know. What we do know is that it is not to be found in Heraclitus⁵⁰ nor in any pre-Socratic fragment, and that no Ionian philosopher thought of "cosmological" fire, air, etc. as different in kind from what we see and handle every day. The first surviving text in which this peculiar notion is asserted is in Plato. It is he, not Heraclitus, who says that the fire in the heavens is "pure," as well as "fairest," "most honorable," etc., while ours is *oudamēi oudamōs eilikrines*, *Phil.*, 29b–30b.⁵¹ But even if Heraclitus had made this distinction, how would it help to answer our question? "Cosmological" fire would still be on a par with water and earth in the series of natural transformations, and the question why it should be elevated above the rest would remain answered. It cannot be answered, I submit, without taking account of a powerful historical influence which passes unnoticed in Kirk's book: that of Anaximenes.⁵² It is here that Heraclitus found the cosmological pattern we are looking for and superimposed it upon the one he derived and developed from Anaximander. This pattern, in sharp opposition to Anaximander's, explains all the things that compose the world as a differentiation [362] of just one of them. Anaximenes' preference for this type of explanation must have been due partly (a) to a genuinely empirical impulse, eschewing an *archē*, like Anaximander's, which must lie forever beyond experience, to put in its place one which is indisputably in this world, as well as out of it, and whose relation to experience can be properly explained (*Hipp.*, *Ref.*, 1, 7, 2), and partly (b) to the conviction that the *archē* must be of the same stuff as that of the human soul,⁵³ doubtless because he held with Anaximander that the *archē* which creates the world also governs it⁵⁴ and is therefore intelligent.

⁵⁰ Nor the parallel one between an *Urfeuer* and its *Erscheinungsformen* in sun, *prēstēr*, etc., assumed by Reinhardt, p. 16—an odd vestige of Zeller's theory, who needed an *Urfeuer* as a prop for the *ekpurōsis*.

⁵¹ Where this distinction in respect of the superior "purity," etc. of *to en tōi panī over to par' hēmīn* (or to *enthade*) is extended to all the *stoicheia*, including earth (29d). Cf., (my "Equality and Justice in Early Greek Cosmology,") *CP* 42 (1947), p. 176 n.173 (**1.85n 173).

⁵² All I can find in Kirk by way of reference to any major relationship between Anaximenes and Heraclitus is the casual remark, pp. 343–44, "It may be that Heraclitus' omission of air is a direct criticism of Anaximenes' acceptance of it."

⁵³ Which is air: A22 and 23, also Aēt., I, 3, 4, listed as B2 in DK⁶, on which see note 55, below.

⁵⁴ *Arist.*, *Phys.*, 203b 11ff.: καὶ περιέχειν ἅπαντα καὶ πάντα κυβερνᾶν, ὥς φασὶ ὅσοι μὴ ποιοῦσι παρὰ τὸ ἄπειρον ἄλλας αἰτίας οἷον νοῦν ἢ φιλίαν, which would certainly include Anaximenes. That air *periechei* the world is also in Anaximenes, B2. Cf. W. Jaeger, *The Theology of the Early Greek Philosophers* (Oxford, 1947), pp. 29–30 and notes; and on the significance of the ascription of *periechein* to the *archē*, cf. also (my "Equality and Justice" (above, n.51)), p. 173n 153 (**1.81n.153).

Though both motives are discernible in Heraclitus, the second far outweighs the first and provides, in my view, the main explanation of the dominant role of fire in his cosmos.

What may have led Kirk to ignore this link is his insistence that "the parallel between man and cosmos is first explicitly drawn by medical speculation in the fifth century" (p. 312). But it *is* drawn in Anaximenes, B2; though much of the wording of this fragment is doubtful, there is no good reason to doubt that it paraphrases an analogy drawn by Anaximenes himself.⁵⁵ [363] And even if we were to throw it all out, we would still have the fact, independently attested, that Anaximenes made air both the *archē* of all things and the stuff of the human soul, and this suffices for our purpose, for this is precisely what Heraclitus does, merely substituting fire for air. A variety of convergent reasons would prompt this substitution in the case of the soul. As the principle of life, soul would be naturally thought of a fire, since the warmth which persists throughout life and fails only after death, was a fact of ordinary experience.⁵⁶

⁵⁵ The upshot of the controversy about this fragment—for the best on either side see Reinhardt, *Kosmos und Sympathie* (Munich, 1926), pp. 209–13, and Kranz, *Hermes* 73 (1938), p. 111 and *Gott. Nachr.*, 1938, p. 145—is surely that it should now be regarded as [an "A" fragment] {a *testimonium* which does not retain the original wording}. How can *sunkrates* be defended for Anaximenes when there is no known use of the word prior to the Christian era? Nor is there any pre-Socratic parallel for the notion that the soul holds the body together while, as Reinhardt points out, this was a common Stoic view. On the other hand, there can be absolutely no objection to the statement that the air *periechei* the world (cf. n. 54, above), *ton holon kosmon* is doubtful (Kranz cites its occurrence in Philolaus, B1, but this is not conclusive), though possible (cf. n. 19, above). Moreover, the comparison of a human with a cosmic phenomenon is also reported for Anaximenes at A7, 6; Kranz compares ὡς περὶ περὶ τὴν ἡμετέραν κεφαλὴν there with οἷον ἢ ψυχῇ ἢ ἡμετέρα here. Finally, the man-world analogy is also implied by Anaximenes' close follower, Diogenes of Apollonia, when he argues that the same thing, air, is that by which man lives and thinks (B4, B5 *sub fin.*; A19, 42 *sub fin.*) and that which governs and thinks in the world. As to what stood for the improbable ἐγκρατεῖ ἡμῶς in the original, the simplest guess is ἡμῶν κρατεῖ. Fränkel (*Dichtung und Philosophie*) p. 348n 20) thinks it anachronistic to credit Anaximenes with the notion of the soul ruling man or his body. Certainly there is no known elaboration of this idea before Plato. But it would be taken for granted from the moment the *psychē* was identified with the thinking, willing self and hence accorded the power of controlling the body or its functions expressed by *kratein* and its derivatives (cf. σκελῶν τε καὶ χειρῶν ἀκρατεῖς, *Hipp. Art.*, 48, γλώσσης ἀκρατῆς, *Aesch.*, *P.V.*, 884; αὐτοῦ κρατεῖν for the self control which is lost in drunkenness, *Antiphon, Or.*, 5, 26). This concept of the *psychē* is amply documented in Heraclitus (cf. especially B118 with B117), and there is no reason why it cannot go back to Anaximenes.

⁵⁶ Anaximenes himself would have had to take account of this fact. Cf. *Diog.*, B5, ἡ ψυχὴ ἄλλο θερμότερον τοῦ ἔξω ἐν ᾧ ἔσμεν. This would make the transition (from "hot air" to "fire") all the easier for Heraclitus. It is possible, perhaps probable, that Anaximenes had also anticipated Heraclitus in explaining sleep and drunkenness as due to the moistening of the soul, for we know that Diogenes of Apollonia held this view (A19, 44). In an interesting paper ("Die Philosophiegeschichtliche Stellung des Diogenes von Apollonia") *Hermes* 76 [1941], pp. 359ff.), Diller attributes these and other similarities between Heraclitus and Diogenes to the direct influence of the former upon the latter. This I very much doubt, since the true affinities of Diogenes—in style

As the [364] principle of thought, soul would be connected both (a) with the heat of fire, since that lapse of intelligence which looms so large in Heraclitus' psychological reflections, sleep, was generally regarded as due to a reduction of organic heat,⁵⁷ and (b) with its light, because of the inevitable association of truth and knowledge with light, of error or ignorance with darkness.⁵⁸ Now since his cosmos is "ever-living" and is "governed" by a *gnōmē*, what would be more natural for him than to ascribe the principles of life and intelligence in the cosmos to the same stuff to which he assigned them in the case of man? That the analogy between this cosmic fire and man's fiery soul was so complete for him that it amounts to identity, we know from B36, where he says "souls" when he means "fire"; as Kirk rightly remarks (p. 341), "Heraclitus has here put soul in the place of cosmic fire." Renouncing the Milesian concept of an *archē* which "contains" the world, he would have to give a physical explanation of the world's "government" by the *archē* in terms of the physical relation of fire to everything else in the world; and this he did, as we have seen, by imputing to fire the common measure whose preservation throughout all change ensures the "justice" of all "strife." This reconstruction, I submit, explains why fire should have in his system its otherwise inexplicable preeminence over water and earth; and it does so by showing how an idea, derived initially from Anaximenes, was grafted upon a concept of justice-in-strife developed from ideas supplied by Anaximander.

Two other cosmological doctrines—his affirmation of the eternity of the world (B30), and his denial of the infinity of fire and therewith the sum-total of existence⁵⁹—tell against both [365] Anaximander and Anaximenes. Their significance is best appreciated in terms of his rejection of the Milesian axiom that the world is derived from and "governed" by an everlasting and infinite substance which "contains" it. For Anaximander the creative source of the

world is wholly outside of it; for Anaximenes it is both in and beyond the world; for Heraclitus it is wholly within the world, which is itself the theatre of the ceaseless and regular transformations of fire, therefore self-creating, self-governing, self-contained. He could thus transfer to the world that eternal life and youth which was always for the Greeks the unique privilege of divinity. To express this he employs in B30 not only the solemn, traditional formula, "ever was and is and shall be,"⁶⁰ but also the new and proud affirmation, "ever-living," in place of the canonical negatives, "deathless, ageless" (Anaximander, B2, B3) for which he had no use anyhow, since for him the condition of life everlasting is not deathlessness but life endlessly renewed by death in a process where youth and age are "the same" (B88). We do not know what form of expression he gave to his denial of the infinity of fire and the totality of being; all we learn from Aristotle and Theophrastus is that he did, without even a hint of his reasons. These we must reconstruct, and our only clue to them is in his new, anti-Milesian concept of the relation of the world-creating *archē* to its creatures. If the two are one, as in Heraclitus, then the *archē* neither need, nor can, be infinite. It need not, for no matter how limited may be its mass, its energy, ever-renewed by reabsorbing its own creatures, is inexhaustible, and thus sufficient to maintain it for all time to come. It cannot, for it is interdependent with its creatures and can be no more infinite than they, if it were, the balance of their mutual "exchanges" would be completely upset.⁶¹ [366]

Finally, what of that doctrine which many in the ancient world considered his most original invention,⁶² the unity of the many and the sameness of opposites? If, as Kirk says from time to time (e.g., pp. 121, 344, 402), this only meant for Heraclitus that "opposites are essentially connected" or "not really disconnected," how could we think of it as Heraclitus' "great discovery" (Kirk, p. 344)? That the many and different things which compose the world are all essentially connected, so much so, that they are all one and the same thing, is the rudimentary truth about the world as conceived by Anaximenes.⁶³ When Heraclitus declared that "all things (come) from one and one from all" (B10) or even that "all things are one" (B50), he was saying something with which Anaximenes would have agreed as a matter of course. But

(cf. Anaximenes, A1, *κέρχεται . . . λέξει . . . ἀπλῇ καὶ ἀπερίττω*, with Diog., B1, *τὴν ἐρημνείαν ἀπλὴν καὶ σεμνήν*), main cosmological doctrine (the same *archē*, air, infinite, giving rise to an infinity of worlds), and primarily "scientific" bent of mind with no discernible ethical or political interest—are with Anaximenes. It is most unlikely that Diogenes would take over the details noticed by Diller from a thinker with whose temper and fundamental doctrine he was so much out of line. Things common to Heraclitus and Diogenes are much more likely to be derived by Heraclitus from Anaximenes, and by Diogenes either directly from Anaximenes or from intermediaries other than Heraclitus.

⁵⁷ Parm., A46b, *σῶμμιον . . . Emp. et Parm. refrigerationem*. Emp., A85, *τὸν μὲν ὕπνον καταψύξει . . . τῇ δὲ παντελεῖ θάνατον*, Hippocr., *De flat.*, 14, *ὁ ὕπνος πέφυκεν ψύχειν*.

⁵⁸ Attested, e.g. in *phainō*, originally "shine," derivatively, "bring to light, disclose, reveal." Parmenides speaks of his dark form as *nukt' adaē* (unknowing) B8, 59.

⁵⁹ Arist., *Phys.*, 205a 1–4; Theophr., *Phys. op.*, frag. 1 (*Dox. Graeci*, p. 475). Diog. Laert. 9, 8. It is strange that this important doctrine should be so seldom noticed in the modern literature; Kirk is typical in ignoring it completely. It is briefly recognized in Zeller-Nestle, *Die Philosophie der Griechen*, pp. 862–63, but with the suggestion that Heraclitus did not assert this doctrine explicitly; I see no reason for this opinion: he would have every reason for doing so against Anaximander and Anaximenes, if he did not believe in the infinity of fire.

⁶⁰ Reinhardt, pp. 10–11; also in *Parmenides* (above, n 5), p. 176n.2.

⁶¹ One might still ask why the creatures too could not be infinite. The question could hardly be bothered Heraclitus. He must have assumed, as did every known thinker of classical Greece, that the visible world is finite in extension: the only thing ever heard to be infinite was something other beyond the visible world, as for the Milesians and many others after them, or of a different order of being from it, as for Melissus, who was also the first to offer a formal argument against the possibility of more than one infinite being (B6).

⁶² Cf. Philo., *Quis rer. div. haer.*, {212–13 *ἐν γὰρ τὸ ἔξ ἁμφοῖν τῶν ἐναντίων . . . οὐ τοῦτ' ἐστὶν ὃ φασι "Ἕλληνες . . . Ἡράκλειτον κεφάλαιον τῆς αὐτοῦ προσησάμενον φιλοσοφίας αὐχεῖν ὡς ἐφ' εὐρέσει καὶνῃ*}}

⁶³ And is spelled out in the only exposition of this type of cosmology available to us in extant fragments, that of Diogenes (at B2).

the difference would still be enormous. The sense of the unity of all things would be both lucid and prosaic for Anaximenes: simply, that all things are differentiations of air.⁶⁴ Heraclitus' speculative imagination transforms this straightforward cosmological theorem into an assertion of the unity of all differences whatever, including moral ones, and pursues its consequences to that reckless and bewildering conclusion that "for god all things are fair and good and just (B102) which, if true, would be fatal for all morality, not excepting his own.⁶⁵ I cannot discuss here the fragments [367] which assert this and other aspects of the most paradoxical of all his doctrines and explore its connection with the doctrines of the justice of all strife and *palintropos harmonia*. Of Kirk's interpretation of these fragments, I shall merely remark that it is sober and sensible throughout, and that its only fault is to discount that part of their sense which is inherently obscure and, so far as it is clear, profoundly disturbing not only to the moralist but also to the logician. It proved disturbing enough to the latter to provoke in Parmenides a reaction, violent in the extreme,⁶⁶ yet immensely fruitful, for it issued in a doctrine of Being which served as the foundation of the great cosmological constructions of Empedocles, Anaxagoras, and the atomists. In a singularly Heraclitean turn of events, Heraclitus, ignored in Ionia⁶⁷ by the best minds of the generation that followed him, lived in them only through the death of his own system in Parmenides.

⁶⁴ For an excellent statement of this aspect of Heraclitus' relation to Anaximenes, see Cherniss, *Aristotle's Criticism of Presocratic Philosophy*, pp. 331ff.

⁶⁵ Kirk (pp. 180–81), following Wilamowitz and others, argues that the second part of the fragment, ἀνθρώποι δὲ ἃ μὲν ἄδικοι ὑπελήφασιν ἃ δὲ δίκαιοι, can hardly be wholly authentic; ὑπελήφασιν, though barely possible, is most unlikely for Heraclitus. Kirk underwrites Mazzantini's suggestion that the original read something like ἀνθρώποις δὲ ἃ μὲν ἄδικοι ἃ δὲ δίκαιοι. With all this I agree. But what follows for the sense of the whole fragment? Man's wisdom is to god's what an ape's is to man's (B83); since men's moral distinctions do not exist for god (first sentence of B102), must they not be ultimately illusory? I fail to see how this difficulty is solved by Kirk's elucidation. moral distinctions, he says, submerged only for (god's) "synthetic" view, are still "necessary" and "legitimate" for the analytical view (man's) pp. 180–81. But what Kirk calls the "synthetic" view is "wisdom" for Heraclitus (B50)—not only for god, but for man too so far as he can reach it. Hence the wiser man becomes, the closer he comes to the view that "all things are fair and good and just," and if this does not make moral distinctions illusory, I do not know what would.

⁶⁶ Cf. Cherniss (above, n.64) pp. 336ff.

⁶⁷ I say "Ionia" to allow for some Heraclitean influence on Empedocles ("Equality and Justice" [above, n.51], pp. 164–65 (**1.70–71)), though it is subordinate to that of Parmenides. In Ionia itself not one of Heraclitus' distinctive doctrines is conserved by Anaxagoras or Leucippus; so far as we know, they do not even acknowledge their existence by a word of refutation. Democritus must have known intimately Heraclitus' book, for it influenced his style (E. Norden, *Annke Kunstprosa*, I [Berlin, 1915], pp. 22–23) and doubtless also some of his ethical reflections; but he too writes cosmology and ontology as though Heraclitus had never existed. The only possible anti-Heraclitean polemic is Melissus, B8 (so Kirk, p. 140), a feeble echo of Parmenides' great assault.

PART THREE

THE ELEATICS

PARMENIDES' THEORY OF KNOWLEDGE

PARMENIDES' frag. 16 has been taken for a general statement of his theory of knowledge. I argue that it is no more than his doctrine of sense-perception, since it views thought as a passive record of the "much-wandering" ratio of light to darkness in the frame. Theophrastus' report that Parmenides explains "better and purer" thinking by the preponderance of light must refer to the active phases of thought, memory, and judgment. When these are perfect, the ratio of light to darkness must be one to zero, and the knowledge of Being must represent a state of unmixed light.

I. THE PROBLEM

Ὡς γὰρ ἐκάστοτ' ἔχει κράσις² μελέων πολυπλάγκτων,
 τὼς νόος ἀνθρώποισι παρίσταται τὸ γὰρ αὐτό
 ἔστιν ὅπερ φρονέει μελέων φύσις ἀνθρώποισιν
 καὶ πᾶσιν καὶ παντί τὸ γὰρ πλεόν ἐστὶ νόημα.³

"For men's mind comes to them at each time in accordance with the mixture of their much-wandering frame.⁴ For to all men and to each the nature of the frame is the same as what it thinks.⁵ For what preponderates⁶ (*sc.* in the frame) is the thought."⁷

Reprinted from *TAPA* 77 (1946) 66–77. Footnote 38a has been renumbered as 39 and 54a as 55, with corresponding changes to superscript numbers.

¹ *καί* in DK⁴ 28 B 16. 'Εκάστοτ' is "the best attested reading of Theophrastus," W. D. Ross on *Anst. Met.* 1009B 22–25; it is now adopted by Verdenius (*Parmenides* [Groningen, 1942] 6) and Frankel ((review of W. J. Verdenius, *Parmenides*) *CP* 41 [1946], 168). To Verdenius's study I shall refer hereafter by the author's name.

² Following Stephanus' emendation, κράσις for κράσιν of the ms. Cf. Verdenius and Frankel, *loc. cit.*

³ Parmenides B. 16. (All pre-Socratic fragments are cited here as in DK⁴.)

⁴ Frankel argues that *melea* here refers to the organism as a whole, "since there is no special word at this time for the living body, but only expressions like 'members'" ("Parmenidesstudien," *GottNachr* [1930], 153–92, at 172n 3. I shall refer to this study hereafter by the author's name).

⁵ Following Verdenius's rendering of this sentence (15), which incorporates Frankel's insight that τὸ αὐτό should be connected with ὅπερ, rather than with πᾶσιν καὶ παντί in the traditional renderings.

⁶ Literally "the more."

⁷ For the translation of the fragment as a whole and for a masterly demonstration of the logical connection of the three sentences, see Verdenius, 6–18.

That this is at the very least a doctrine of sense-perception is clear both from Theophrastus' commentary in *De sensu* 3, and by comparison with Empedocles.⁸ The main principles of the doctrine [66] are (i) the perception of like by like and (ii) the identity of percipient and percept. "We see earth with earth, water with water," says Empedocles (B.109). Similarly Parmenides holds that the light and dark forms in our frame think respectively light and darkness in the world. Thus my thought of the earth is identical with the dark form in me that does the thinking.⁹

Trouble begins when we press the analogy with Empedocles one step further. Perception, as Parmenides speaks of it here, occurs through the forms in mixture. Similarly in Empedocles: the percipient is the blood, a mixture of the four "roots"; and the formula of the mixture is equality.¹⁰ Given the equality of the four roots in the cosmos,¹¹ this formula would follow directly from the identity of percipient and percept: to perceive the world as it really is, our blood must contain the four roots in equal proportions. Parmenides' cosmos is drawn to the same design of *isonomia*.¹² Would it not then follow by analogy with Empedocles and by the same logic that to think this equal mixture in the world we would need the same equal mixture in our frame? Yet we gather from Theophrastus that no such conclusion was ever drawn in Parmenides' poem.¹³

A second and graver difficulty is in store for us if we take the fragment as a physical account not only of sense-perception but also of the knowledge of Being itself. It has been so taken by many modern commentators.¹⁴ Yet the objections are insuperable. [67] For the identity of subject and object of

⁸ Verdenius rightly compares Emp. B108 and B106.

⁹ Theophr. *De sensu* 4. The dead man "because of the loss of fire" perceives "the cold and silence and the opposite (sc. of light)": i.e., he thinks the attributes of earth because he is earth. The conception of the dead as earth is one of the oldest ideas in Greek literature. Cf. Rohde, *Psyche* (Eng. tr., London, 1925) 460n.142. "As early as *Il.* 24.54 the body deserted by soul and etc. is called *kôphê gata*."

¹⁰ Emp. B105 and B98. Theophr. *De sensu* 8 and 11.

¹¹ Emp. B17.27.

¹² Parm. B.9.4.

¹³ *De sensu* 3: "But what if they (sc. the hot and the cold) are equal in the mixture? Will thought then occur, or not? And what will be its disposition? Concerning this he has determined nothing." One could discount this as no more than a stupid misunderstanding of the last sentence of frag. 16: if hot and cold are equal, then there is no *pleon* of either in the mixture, hence no thought. But though Theophrastus was not above unimaginative literalism, his report of what was or was not in his (presumably full) text of Parmenides' poem must be taken as final.

¹⁴ Notably Fränkel (170 and 714). Verdenius (9-10 and 65) rightly rejects Fränkel's interpretation of *noos*, *noëma* in frag. 16 as "insight into Truth" but still thinks of the fragment as a doctrine of knowing in the double sense of sense-perception and knowledge of Being. See the criticism of Fränkel's view in von Fritz, "Noos, Noein, etc., Part I," *CP* 40 (1945) 223-42, at 239n.90, and 241n.95.

thought applies no less to the knowledge of Being than to the knowledge of sensible things: "to think (sc. Being) and to be are the same thing."¹⁵ It follows that only a being can think Being, while the "much-wandering" frame is only too obviously a chunk of Becoming. Moreover, Being is "all alike,"¹⁶ while the frame is a mixture of diametrically unlike elements.¹⁷ A mere preponderance of light could not possibly meet the difficulty. For if the thought is as the mixture, then even the tiniest bit of darkness in the frame would still produce a "mixed" thought, which would certainly not be the thought of Being.

II. SUGGESTED SOLUTION

Let us begin by asking what Theophrastus could have had in mind when he said that "better and purer (sc. thought) will be due to the hot."¹⁸ It could not be fragment 16 by itself: there is not a word here about the preponderance of the hot as such. Our best clue to the answer comes a few lines later in Theophrastus, when he tells us that "memory and forgetfulness are due to these (sc. the hot and the cold) through the mixture." What this means becomes clearer if we recall that sleep, old age, and death¹⁹—all of which figure in Greek thought as states of partial or total forgetfulness²⁰—were all explained by Parmenides as recessions of the light form in the frame. Here then is one mental function which depends entirely on the predominance of the hot: memory. When the light form loses its predominance, as in sleep and old age, there is a corresponding fading of memory. At death memory blacks out altogether, but perception does not. Thus memory and sense-perception are independent variables. Memory is a power of the living, wide-awake soul; as such it depends on the excess of light. Sensation, on the other hand, depends on light and darkness in any ratio whatever. An excess of darkness ruins memory but leaves intact the sensitiveness of the dark form. All that the dark [68] form perceives in the living frame it continues to perceive after death.

This extraordinary notion of the corpse-like passivity of sense-perception

¹⁵ B.3, translated literally. Cf. also B.8.34 (the sense as in von Fritz, "Noos, Noein," 238).

¹⁶ *Pan homoion*, B.8.22.

¹⁷ B.8.55-59.

¹⁸ *De sensu* 3.

¹⁹ Parm. A.46a (Aet. 30.4); A.46b (Tertull. *De anima* 45); Theophr. *De sensu* 3.

²⁰ Death, *lêthēs domos*, Simon. 184.6; *lêthēs pedion*, Aristoph. *Ran.* 186, etc. Old age to *lêthēs gêras*, Plato *Phaedr.* 276D. Sleep, Heracl. A.16 (Sext. *Adv. Math.* 7.129). For *lêthē* as evidence of *pro tanto* recession of the active powers of the mind, see the theory of Diogenes of Apollonia (Theophr. *De sensu* 44-45), the same physical condition which explains *lêthē* explains also 20.24 to *hêton phronem* in sleep and drunkenness.

should surprise no reader of Parmenides' poem. To see this matter in perspective, we may go back²¹ to Heraclitus, who taught that the truth "hides"²² and that without it the senses are worthless: "fools, though they hear, are like the deaf."²³ Ears and eyes are only "witnesses";²⁴ mind must be the judge. *Krisis*, *krinein* do not occur in any Heraclitean fragment.²⁵ But they are favorite words with Parmenides. The "knowing man" is charged by the goddess to "judge by reasoning the much debated proof she utters";²⁶ even in the presence of her divine revelation, his judgment must not lapse into quiescence but must remain active and alert to scrutinize her argument. The "know nothings," on the other hand, are "unjudging hordes" (B6.7), whose senses are senseless, their "eye sightless, their hearing full of noise."²⁷ Heraclitus pictures such people as sleepwalkers.²⁸ Parmenides conveys the same impression of aimless, helpless passivity: "borne along, deaf and blind, stupefied," "forced" by "custom" down a road not of their own choosing.²⁹

When Parmenides speaks of the thinking frame in fragment 16 as "much-wandering," he links it unmistakably with the "wandering" mind of the "know nothings."³⁰ "Wandering" is the best [69] sense-perception can produce, for in it our thought are not ours to command; they "come to us" through the body, passively recording its changing ratio of darkness to light. But there is another dimension of thought in which the mind has the power of initiative; it can recollect, judge, and reason. Heraclitus had identified this thinking soul with fire; through the "turning" of this fire into water, he had explained the deflection of reasoning-power and loss of self-control, as in the case of the drunken

²¹ I cannot examine here Reinhardt's (*Parmenides*, Bonn, 1916) reversal of the traditional relation of Heraclitus to Parmenides, except to note that (i) his argument rests on a chronology which has not carried conviction, and (ii) the main thesis of Parmenidean physics—that each of the opposites is "in every way the same as itself and not the same as the other" (B.8.57–58)—makes proper sense only against the Heraclitean doctrine that things "turn" into their own opposites, and thus opposites are "the same thing."

²² As Reinhardt observed (*Parmenides* 222–23) *physis* in B.123 (as also in B.112) has the force of "the true disposition of things." Cf. B.54, B.45.

²³ B.34; cf. B.17, B.72.

²⁴ B.107.

²⁵ But Heraclitus does use *gnōmē* (B.78, B.41), which also means "judgment," including the judicial sense of the word, as, e.g., in the dicastic oath, γνῶμη τῇ ἀρίστη, τῇ δίκαιοτάτῃ.

²⁶ B.7.5. Cf. *krisis*, *kekristai*, B.8.15–16.

²⁷ I combine here B.6.7 with B.7.4. Cf. the first sentence in Heracl. B.34.

²⁸ Cf. B.89 with B.2 and B.1.

²⁹ B.6.5–7 with B.7.3. Coxon ("The Philosophy of Parmenides," *CQ* 28 [1934], 134–44 at 134n.10) rightly contrasts the aimless "know nothings" with the "knowing man's" purposefulness, he "is already *eidōs* because he knows the goal . . . on which his will is already set (B.11.—*ἴσθον τ' ἐπὶ θυμῷ ἰκάνει*)

³⁰ *Plutontai*, *plukton noon*, B.6.5–6.

man who "doesn't know where he is going."³¹ Parmenides recasts this theory in the mold of his own physics. For him there could be no question of fire "turning" into its own opposite; a Parmenidean form is unalterably itself.³² He therefore solves the problem by assuming that both fire and its opposite are present in the soul. Variations in the strength of fire can now be explained by the increase or reduction of either opposite, absolutely or relatively to the other. These opposites in mixture provide Parmenides with something Heraclitus never had: a physical theory of sense-perception as distinct from a physical theory of judgment.

It was Empedocles who developed to the full this new theory, and we can now see where and why he diverged from the Parmenidean base. Empedocles did not share Parmenides' harsh estimate of sensation. If used aright, the senses are "openings for understanding";³³ there is no necessary conflict between their reports and the highest truth that the mind can discover.³⁴ When we see "earth with earth," what we see is not "deceitful" appearance, but Being. Perception and judgment can thus be in perfect harmony. Therefore, the same physical condition is appropriate to both, and the formulae for "most accurate sense-perceptions" and "wisest thoughts" coincide.³⁵ In Parmenides, on the other hand, the physical formulae for sense-perception and judgment could not be the same, for the logical results of the two processes are at loggerheads. The senses must report the duality of light and darkness; judgment must insist that this duality is only "seeming," "custom," and "name,"³⁶ since Being is "all alike." If "the [70] nature of the frame is the same as what it thinks," then the frame should certainly be half light, half darkness, exactly like the universe. This, we may assume, Parmenides took for granted. But in view of Theophrastus' remarks,³⁷ we must think of it as an implication that was never made explicit in the poem. Given his doctrine of the "deceitfulness" of the world of the senses, we could scarcely expect him to attach any weight to a formula for correct sensation. It would thus be left to Empedocles to exploit the epistemological uses of the symmetry of microcosm and macro-

³¹ B.117, cf. B.36, B.77, B.118.

³² See above n.21.

³³ Emp. B.3.12, *poros noēsai*.

³⁴ *Ouk apatēlon* in Emp. B.17.26 has been often compared with *apatēlon* in Parm. B.8.52.

³⁵ Theophr. *De sensu* 11.

³⁶ *Ta dokounta*, B.1.32. *Onoma*, *onomaion*, B.8.38 and 53, B.9.1, B.19.3, *Nomizein*, B.6.8, *Idōs*, B.7.3. Cornford ("Parmenides' Two Ways," *CQ* 27 [1933], 97–111, at 100) rightly observes that "opinions" or "beliefs" is "too narrow a rendering" for *doxa*, *ta dokounta* (B.1.30–31, B.8.51; B.19.1), which include not merely opinions but also the physical appearance on which this opinion is based. *Doxa* in Parmenides is judgment enslaved to the senses, deprived of its distinctive power of initiative.

³⁷ See above n.13.

cosm. For Parmenides the only source of truth is judgment; hence the one important question in the physiology of knowledge would be the physical formula for right judgment. For this we must take Theophrastus' report:³⁸ it was the preponderance of light.

Yet it would be wrong to jump to the conclusion that this preponderance provides also the physical formula for the knowledge of Being. No such formula could be given without translating Being into terms of Becoming. We are here face to face with the central paradox of Parmenides' theory of knowledge. The mortal frame, *qua* mortal, cannot think Being.³⁹ Yet the "knowing man" can and does think it. Two radically different entities answer to the same name: the "wanderer," who thinks Becoming, and the "unshaken heart,"⁴⁰ that thinks Being. To resolve the [71] paradox is impossible, for it is only the epistemological counterpart of the ontological dualism of Being and Becoming. But though this dualism is never broken down, it is nevertheless mediated. For we know that each of the physical opposites is endowed with the essential attribute of Being: absolute self-identity.⁴¹ Here, it seems to me, is the clue to the problem.

If thinking were identified with one of the two forms to the absolute exclusion of the other, then so far the thinking soul would be exempt from change. Parmenides envisaged the state of death as just such a release from one of the opposites. The dead man is all darkness and, therefore, thinks darkness unalterably. Here is an end to "wandering"; but it is the stability of death. Could there not be a diametrically opposite state, all light, as death is all darkness? The mind's power to think Being must imply⁴² just such a power to divest

³⁸ Though Theophrastus himself was far from clear about the precise reference of this formula. His confusion is evident in the context. after saying that "the better and purer thinking will be due to the hot," he continues, "and yet this too requires a certain symmetry," then cites the fragment, as though this could explain the need for "a certain symmetry," and then caps the series of anacoloutha with the remark, "for he speaks [where? in this fragment only? or generally?] as though sense-perception and thought (*to phronein*) are the same thing." On any interpretation this last remark is thickheaded, cf. Theophrastus' statement (*De sensu* 25) that Alcmaeon *did* distinguish sense-perception from *to phronein*. would anyone suggest that this distinction was less clear in Parmenides than in Alcmaeon?

³⁹ Hence the contrast of *brōtōn doxai* with knowledge of Being (B 1.30, B.8.39, 51; cf. B.8.61, B.19.1). I agree with Verdenius (56n.3) that Coxon's idea ([above, note 29] 134) that there is a systematic distinction between *anthrōpoi* (men in general) and *brōtoi* (philosophers) is "quite arbitrary." Everybody has *doxas broteias* in sense-perception, and the "knowing man" is in the same boat with other people: he can't help *seeing* change, though he *knows* it isn't real (and see further below, near note 49).

⁴⁰ B.1.29, *atremes* here is a strict counterpart of *atremes* as asserted of Being in B.8.4

⁴¹ See above, note 21, and cf. the description of light (*heōutōi pantose i'outon*, B.8.57) with that of Being (*i' auton*, etc., B.8.29 and *hot pantothen ison*, B.8.49).

⁴² This conclusion does not (and could not) rest on empirical evidence. Cf. Parmenides' injunction, "You will not discover the thinking (*sc.* of Being), except through Being in which it (*sc.* the thinking of Being) is revealed" (B.8.35-36), i.e., our only clue to the nature of the thought of Being is Being itself.

itself completely of the darkness in the frame, merge itself wholly with the light, and thus be as changeless as light, "on all sides the same with itself." So immovable a thought could only have Being as its object; not the "seeming" light of the senses, whose apparent qualities depend on the felt contrast with darkness, but the purely logical object, whose every attribute can be deduced from its known self-identity. It would think light as pure Being.

That there is a measure of conjecture and reconstruction in this conclusion is obvious. It is only a guess at a riddle which the surviving fragments leave unsolved. Yet it can be confirmed indirectly along two independent lines.

First of all, we can return to Theophrastus' saying that the "better and purer" thinking depends on the predominance of the hot. As appraised above, this refers to the active aspect of the mortal mind, memory and judgment. If there were a state of perfect memory and flawless judgment, a state from which forgetfulness and error were absolutely excluded, then the ratio of light to darkness should be as one to zero. But this is just what the knowledge of Being is intended to be. Here one can "see securely [72] with the mind things absent as though they were present";⁴³ what ordinary memory attains only uncertainly and fitfully is here enjoyed continuously with a lucidity unbroken by a single gap or fissure. Judgment too is similarly transfigured. It is no longer as we know it in the mortal frame, hesitating between alternatives, making false starts, and then being forced to double back on its own tracks. In the doctrine of Being, it has found at last the true road and can follow it to the very end of all truth. So infallibly secure, judgment must have for its base not merely "more" light, but all light.

Second, we may look to the allegory of the Proem, which associates the revelation of Being with unmixed light. The realm of night, where Parmenides' journey begins,⁴⁴ is not unmixed darkness. The chariot with its "blazing" axle,⁴⁵ and the Sunmaids, its charioteers, symbolize the light that mixes here with the dark. But the emissaries of light are handicapped in the dark-

⁴³ B.4.1. Cf. Arist. *De mem.* 450a.26, πῶς ποτὲ τοῦ μὲν πάνθους παρόντος τοῦ δὲ πράγματος ἄπόντος μνημονεύεται τὸ μὴ παρόν; Parmenides' words here have obviously a wider reference, they envisage not only memory but all mental functions in which the *noos* transcends the immediately presented data (*ta pareonta*) to which the frame is always tied in sense-perception (cf. Emp. B106).

⁴⁴ For the interpretation of the symbolism, I am largely indebted to Fränkel, 157. With Fränkel I take *domata Nuktas* to mean the world in which the "knowing man's" journey begins. Kranz (SPAW [1916], 1161) and Bowra ("The Proem of Parmenides," CP 32 [1937], 97-112, at 102) take it to refer to another region from which the Sunmaids enter our world. But this seems an unnecessary complication of the symbolism: why should the Sunmaids have to start their journey in "mansions of night" before entering our world? Hes. *Th.* 744 does not cover the point. The *taektōn* in the two instances is quite different, in spite of some obvious similarities. Parmenides envisages two different roads, belonging to Night and Day respectively; Hesiod, a common thoroughfare, traveled alternately by Night and Day.

⁴⁵ *Anthomenos*, B.1.7. See Bowra, "The Proem," 104.

ness; the faces of the Sunmaids are veiled. They cannot bring their revelation into the dark world. They can only take the "knowing man" out of this dark world altogether, past the great gates, into the realm of light. Here with unveiled faces they can lead him at last to the goddess who reveals the Truth. Translated into physical terms, this can only mean that though the quest for Truth begins with a mere preponderance of light, it can only be completed in a state of mind which is free from any darkness whatever.

It remains to add that this account rehabilitates certain items of evidence which have been ignored or explained away in some recent interpretations. Aristotle's repeated statement that Parmenides [73] associates the hot with Being, the cold with non-being, can now be accepted.⁴⁶ And the natural sense can now be restored to the much-disputed clause in the introduction to the cosmology:

For mortals have made up their minds to name two forms, τῶν μὲν οὐ χρεῶν ἔστιν (Parm. B.8.53–54)

If one translates faithfully and without *a priori* commitments to theory, one can only get from the last clause, "one of which should not be named." To render instead with Cornford, "of which so much as one should not be named,"⁴⁷ or else with Verdenius, "of which only one should not be named"⁴⁸ is to take liberties with the text which should surely be avoided if the literal translation makes sense. It does make sense on the present interpretation which, incidentally, has been reached quite independently of this particular text. One of the two forms, the dark, should *not* be named, because non-being is unthinkable and unutterable, and darkness is the non-being of light and is twice described in negative terms: "invisible night" and "unknowing night."⁴⁹ Yet to a frame which is itself a mixture of darkness and light, darkness will necessarily appear as something positive, "compact and solid" (B.8.59). Even the "knowing man" will, as man, continue to think and name the form which ought not to be named. That is why he must study physics. His only defence, as man, against the deceitfulness of appearance is to master the deceitful order which produces it.

⁴⁶ Of the two references (*De gen. et cor.* 318b.6, *Met.* 987a.1), the second is more exact: "he ranges (*tattei*) the hot with Being," rather than "he says that Being is fire." As noted above, not the sensible properties of fire in contradistinction to night, but the positive self-identity of fire, is Being. Verdenius appeals to the equality of fire and night in Parmenides to discredit Aristotle's testimony. But this equality holds only within the world of appearance; it explains the "deceitful" order of *this* world, and has no bearing on the relation of either light or darkness to Being.

⁴⁷ Plato and Parmenides (London, 1939), 46

⁴⁸ Verdenius 62, following A. A. Diès, and H. Diels's earlier view

⁴⁹ B 9.3, B 8.59. As Fränkel observes (177n.4) *adaē* cannot mean "dark" (so in LSJ, s.v., II) but only "unknowing." This expression, incidentally, provides good confirmation of the status of the dark element in the present interpretation of Parmenides' theory of knowledge

III. SOME CONCLUSIONS

Bowra's fine study of the Proem⁵⁰ concludes with these words: "Parmenides regarded the search for truth as something akin to the experiences of the mystics, and he wrote it with symbols taken [74] from religion because he felt that it was itself a religious activity." If the foregoing interpretation is correct, not only the Proem, but the logic and the physics as well, bear out Parmenides' affinity to mystical religion. The goal of this religion was to build a bridge across the traditionally impassable gulf that separates the human from the divine.⁵¹ Parmenides' logic must have seemed to him just such a path beyond the limits of mortality. "A mortal must think mortal, not immortal, thoughts,"⁵² had been the common belief. And mortal thoughts never strike certainty;⁵³ by common consent this was the privilege of the gods. Yet in his doctrine of Being, Parmenides found certitude and security such as no god could surpass.⁵⁴ He must have felt as did Galileo two thousand years later: that there is knowledge in which "the human understanding equalleth the divine as to the objective certainty, for that it arriveth to comprehend the necessity thereof, than which there can be no greater certainty."⁵⁵ Unlike Galileo, Parmenides believed in the identity of thinker and thought. He would therefore conclude that he who thinks Being is what he thinks, and thus partakes of the agelessness and immortality of Being itself.⁵⁶

Mystical religion thought of man as a mixture of earth and aether.⁵⁷ These are the familiar Ionian opposites, the dark and the light, the cold and the hot. But as religious symbols they belong to a different universe of discourse:

Greatest Earth and Aether Divine,
One the father of men and of gods,
The other . . . breeds mortals . . .⁵⁸

Parmenides' physics materialize this fantasy. Here too man is made up of two forms, the one aethereal,⁵⁹ the other earthy. The [75] first, if wholly detached

Above, n 44

⁵¹ "I go about you an immortal god, no mortal now," Emp. B 112.4. Cf. the promise of the Phourios tablet, "Thou shalt be god instead of man" (DK⁵ 1.B 18.10; cf. *ibid.* 20.4).

⁵² Epicharmus B 20

⁵³ Hdt. 7.50 2, εἰδέναι δὲ ἀνθρώπων ἔόντα κῶς καὶ τὸ βέβαιον

And he did so with perfect confidence that there is no *hubris* in this venture, but "*themis* and *nomos*" (B 1 27–28)

⁵⁴ Cited from the *Dialogue of the World Systems* by De Santillana, *Problems of Empiricism and Rationalism* (Chicago, 1941), 2.

⁵⁵ Cf. Plato, *Phaedo* 79d

⁵⁶ I am the child of Earth and starry Sky," Peteia tablet (DK⁵ 1.B 37.6) Cf. the epitaph on the Athenians fallen at Potidaea, IG 1 442, and also Epich. B9; Eur. *Suppl.* 533–34, frag. 839 8–11,

Lur. frag. 839.1–4.

⁵⁷ *Ouria* is *aetherion*, B 8.56.

from all association with its opposite, is the form that knows Being and has Being. The other can neither know Being nor be. The first is the symbol of eternal life, the other the symbol of death.

Thus the philosophy of Parmenides is a strange blend of mysticism and logic. It is mysticism, for its goal is not the gradual and cumulative correction of empirical knowledge, but deliverance from it through the instantaneous and absolute grasp of "immovable" truth. This is not the way of *technē*, but the way of revelation; it lies "beyond the path of men" (B.1.27). Yet this revelation is itself addressed to man's reason and must be judged by reason. Its core is pure logic: a rigorous venture in deductive thinking, the first of its kind in European thought. This kind of thinking could be used *against* the world of the senses. It was so used by Zeno. But fortunately for philosophy Parmenides found a better use for it. His grounding in Ionian physics got the better of his contempt for the mock-world of the senses, and he gave to his doctrine of Being a physical application, attributing the self-identity of Being to each component of the "deceitful" duality of Becoming. This, with the added assumption that the components are equal, would assure the order of the sensible world as mere sense-perception never could.⁶⁰ This projection of the logic of Being upon the alien world of Becoming was Parmenides' most important single contribution to the history of thought, though it is seldom recognized as such. Without it, his doctrine of Being could have remained a speculative curiosity. With it, he laid the foundations for the greatest achievement of the scientific imagination of Greece, the atomic hypothesis.

But the resulting unity between Parmenidean logic and physics should not be overestimated.⁶¹ His theory of knowledge, as here interpreted, is a warning against this. It shows the dualism between the two forms of knowing, one of which has a monopoly of truth, while the other is only a borrower and remains, for all its [76] borrowings, perpetually insolvent. Parmenides could find no way out of this predicament. So long as logic is set up as a kind of super-physics, the contradiction between logic and physics remains insoluble. The solution requires the recognition of the physical world itself as Being. This was left for Empedocles, Anaxagoras, and the atomists.

In Democritus, Parmenides found his best pupil, for it was he who succeeded in conserving the essential truth of Parmenides' theory of knowledge while purging it of its fantastic denial of sense-experience. Unlike both Empedocles and Anaxagoras, Democritus recognizes that sense-qualities are pre-

cisely what Parmenides had said they are, *doxa*;⁶² they belong to things in perception, not to things in themselves; they "come to us in accordance with the mixture of our wandering frame."⁶³ But they are not "deceit," for all that. In Democritus the physical world is real; the frame has Being, and the objects it encounters also have Being. Hence sense-qualities can be explained in terms of the true properties of objects in interaction with the true properties of the percipient. They are not appearance *against* reality, but the appearance *of* reality.

⁶² *Doxai epirusmiē*, Democr. B 7. Cf. Democritus' insistence that sensible qualities are *nomōi* with Parmenides' view that they are only "name" (see above, n.36).

⁶³ A statement with which Democritus would agree perfectly (cf. μετακίπτον κατὰ σώματος διαθήκην in his B.9), though with the proviso that for him (as for Empedocles and the medical writers) *all* knowledge depends on the "mixture" of the frame (Theophr. *De sensu* 58). The puzzling sayings of Democritus that we know nothing *atrekes* or *eteēi* are best explained as opposition to Parmenides, who did believe in knowledge exempt from physical change and mixture. Cf. *ouden atrekes sunemen* in Democr. B.9 with *atremes ētor* in Parm. B 1.29 which, as I have tried to show (n 40), is quite literally meant.

⁶⁰ The postulate of equality can be traced back to Anaximander. What Parmenides contributes is the logical insight that equality is meaningless without the still more fundamental assumption of identity: one thing cannot equal another, unless each be self-identical.

⁶¹ As, e.g., in Verdenius (59). The qualitative variety and change of the sense-world are not, as Verdenius would have it, "relative reality" but absolute unreality. That sense-qualities have "relative reality" is precisely the atomistic solution, which cannot be attributed to Parmenides without anachronism.

FRÄNKEL'S *WEGE UND FORMEN* FRÜHGRIECHISCHEN DENKENS

WITHIN THE COVERS of this book is some of the finest scholarly work of our generation. Several of its essays have already become "classical" papers. They have been discussed so often that to review them now would be redundant, particularly at this late date, when the book as a whole has been repeatedly and ably reviewed.¹ So I shall concentrate on two of the more recent papers, which have not as yet received proper attention: the ones on Zeno and Anaxagoras.

[I. PARMENIDES FRAGMENT 16]

But before turning to them, I must say something of "Parmenidesstudien"—not of the whole essay, which was reviewed in *Gnomon* (7, 1931, 474–81), most admirably by Solmsen only a year after its original appearance in *GGN*, but of the one section in it which Fränkel rewrote completely for this book: "Die menschliche Erkenntnis" (173–79) on fr. 16.

The former view that *noēma* here = "die Einsicht, das richtige Denken" is now rejected, and for good reason (see von Fritz, "Nous, Noein, and Their Derivatives in Pre-Socratic Philosophy I," *CP* 40, 1945 [hereafter "von Fritz"], 237–40). The change in no way affects the original observation that in Homer and still in Pindar expressions like *melea* or *guia* are used for "der beseelte Leib," so that *melea* in this fragment are, as Alois Patin had divined (*Parmenides im Kampfe gegen Heraklit*, *Jahrbücher für klassische Philologie*, Suppl. vol. 25, 1899, 491–660, here 628), not sense-organs but "das Gesamttemperament des Leibes." Also untouched is Fränkel's major contri-

Review of Hermann Fränkel, *Weg und Formen frühgriechischen Denkens: Literarische und philosophisch-geschichtliche Studien*. Edited by Franz Tietze. Munich: Beck, 1955. Reprinted from *Gnomon* 31 (1959): 193–204; collated with articles extracted from the review, printed as "A Note on Zeno B1" and "One World or Many in Anaxagoras?" in Furley-Allen II, pp. 177–83 and 354–60, respectively. Minor changes have been made to punctuation, and headings have been added. Note 39 was added from "One World or Many" (the misprinted *cheontai* in that note has been corrected to *chrōntai*). Material in (angle brackets) constitute other non-trivial corrections by DWG

¹ The most instructive of the reviews I have read (all brief): L. Woodbury, *CP* 53, 1958, 59–61; T. B. L. Webster, *AnzAW* 9, 1956, 27–29; Verdenius, *Mnem. syn. IV* 10, 1957, 341–43

bution to the translation, *sc.* that *hoper* is an accusative; in place of the traditional rendering, "it is the same thing, *sc.* the nature of the limbs, which thinks," this gives us, "the same as what one thinks is the nature of the limbs" (so Fränkel, 175) or, better in my opinion (cf. Verdenius, *Parmenides*, Groningen, 1942 [hereafter: "Verdenius"], 15; cf. also Fränkel, 177), "the nature of the limbs is the same as what it thinks."² As for the cryptic *to pleon*, I see no alternative to Theophrastus' interpretation (*De sensu* 4, κατὰ τὸ ὑπερβάλλον ἔστιν ἡ γνώσις) and would suggest taking *to pleon* as the relative excess (hence, "ratio") of light/dark in the limbs: thus a 3/4 distribution of light/dark would be a darker thought than, say, a 9/10 distribution, just as we would get a darker grey from a 3/4 mixture of white to black than from a 9/10 one. If this be allowed, the *gar* of the last sentence, which Fränkel finds so baffling, becomes tolerably perspicuous: it is explicative, and the sequence of thought in the fragment is as follows:

1. Thinking varies with the mixture of the limbs.
2. for the nature of the limbs is identical with what it thinks,
3. for the light/dark ratio in the limbs is the thought. [193]

Already in the earlier version, Fränkel had introduced the comparison with *Od.* 18, 136–37 and Archilochus 68 Diehl. This was exploited further by Verdenius *Parmenides*, (27–28). Now Fränkel, following his beautiful study of the same material (27–29 in this book) in "Man's Ephemeros Nature," shows how many things will come to light in a Presocratic fragment if just the right comparison can be found and worked with sure, sensitive hands. The poets say our thoughts are not ours to determine: they come and they go, changing with "the day" Zeus brings on us mortals. So too Parmenides, with "the limbs" in place of the outer world ("the day"), changing (*poluplanktōn*) like "the day" (hence the point of *hekastor*),³ with like power our thought (*ὥς κραῖσις μελέων . . . , τῶς νόος . . .*) which "comes to us" (*parestēken*) but cannot outlast the *krasis* that gave it life—all this because we are mere men (*anthrōpoi*). The whole mood of the first sentence of the fragment, the feeling-values evoked by its every word, could hardly have been caught more precisely.

² The ascription of thinking directly to a physical entity is normal: cf. ([Hippocrates] *On the Sacred Disease*) 19, οἱ ἂν ὁ ἐγκέφαλος γινώσκῃ, 20, ὥστε νοεῖν τε καὶ φρονεῖν [*sc.* αἱ φρένες]. An objection to *meleōn phusis* as the subject might be found in Fränkel's view that the identity is only generic: "(der Art nach) dasselbe . . ." (175). But note that Parmenides says *t' auton . . . hoper*, not *toion . . . hoion* (cf. *toi' hokois* in the Archilochus [69 Diehl] parallel). Conflating existential and predicative being, Parmenides blurs the distinction between sameness and similarity (cf. *pantose t' auton* at B8, 57 with *pan . . . homonon* in *ibid.* 22), hence that between individual and generic identity

³ So Fränkel, preferring in both cases Theophrastus' text to Aristotle's: rightly so, in my opinion, if only because the chances are so much better that the latter was quoting from memory, the former from a book

But there is a problem in what Fränkel does when he gets to the second sentence. He thinks it is directed "umgekehrt wie der erste und wie das archilochische Vorbild: diesmal ist angedeutet, daß die Natur der Glieder ihrerseits von der Natur der Gedanken abhängig ist" (178). I confess I do not find so: nothing in the second sentence to reverse the one-way dependence of thought on limbs, nor yet in the third, if the above sense for *to pleon* is right. Therefore, I cannot see in the same light the two important things Fränkel proposes to explain by the power of thought over the limbs and, therewith, over the world: (1) The world of seeming as a creation of thought. So, certainly, at B8, 53ff.: *katethento . . . , ekrinanto . . . ,* and presto our world, from stars to man. But is not the point of B16 that this frightful error is itself compelled, itself the creature of the world it creates? Fränkel himself has stated this perfectly in *Dichtung und Philosophie des frühen Griechentums*, New York, 1951, 471: "Da wir Menschen ein Produkt der falschen Welt sind, ist unsere Natur fehlerhaft; und wiederum projiziert unsere mißschaffene Natur den Fehler ihrer eigenen Anlage nach außen zurück, und findet in der Scheinwelt ihr eigenes Wesen scheinbar bestätigt." (2) The power of the *noos* to find the true way and follow it out to the vision of Being. Fränkel so describes the moment of illumination: "er war dann nichts als ein lichthafte Sein, das sich nur seines eigenen Seins bewußt war, und alles Helldunkel der niederen Welt, das seine Scheinexistenz dem scheinbaren Nichtsein verdankt, war dann für ihn 'verloschen und verschollen' (8, 21)" (178). Would he not then agree (he seems to be saying it himself) that one who attains this state is "no longer a man"? Surely no earthbound creature could be this wholly aethereal Being. If so, the transition from Seemings to Being cannot be conceived as any power of "Geist der sich den Körper baut" (178), cannot be described in physical terms, but only, as in the Proemium, in the language of the mystic,⁴ in which "light" would be just as symbolic⁵ as are "round" and "heart" in Ἀληθείης εὐκυνκλέος ἀτρεμὲς ἦτορ.

Finally, a query prompted by this remark about B16: "Auch hier (vgl. Fr. 3) gilt eine Art von Identität zwischen Sein und Denken" (178). Can B3 bear the weight of this comparison if Fränkel is to continue, however hesitantly, to understand it (so still in *Dichtung und Philosophie*, op. cit. 458) after Heidel, as the identity of *noein*, not with *einai*, but with *(noein) einai*?⁷ [194] Fränkel

⁴ Cf. Fränkel's remark in another connection that Parmenides' meaning "liegt jenseits aller Vorstellbarkeit" (197).

⁵ I was not clear on this point when I wrote ("Parmenides' Theory of Knowledge") *TAPA*, 77, 1946c, 66–77 (**1. 153–63), but I did, at least, insist that the light which knows and is known as Being "is not the 'seeming' light of the senses," etc. (72 (**1. 159)).

⁶ A recent argument for the more commonplace reading *eupitheos* (G. Jameson, "Well-Rounded Truth and Circular Thought in Parmenides") *Phronesis* 3, 1958, (pp. 15–30 at) 21ff.) I have not found convincing.

⁷ I mention only Heidel's interpretation (*PAA* 48, 1913, 720), because Calogero's (*Studi sull'*

favors a similar translation for B8, 34, "Erkennen ist identisch mit Erkenntnis des Ist" (195)⁸ and I fail to see how this sustains his view that in Parmenides "statt der Gegenüberstellung von Subjekt und Objekt besteht nur ein einheitliches Bewußtsein des Seins von sich selbst" (195): the knowing of Being would not be the self-knowing of Being, even if it were the only knowing there is, unless knowing (or knower) were identical with Being. The usual objection (e.g., Cornford, *Plato and Parmenides*, London, 1939, 34) to getting the identity of thinking and Being out of B3 and B8, 34 (for the latter: von Fritz, 238) has been the alleged implausibility of imputing such a doctrine to Parmenides. Fränkel is in the unusual position of endorsing strongly this imputation but holding back from that very translation that would yield the required direct textual grounding.

[II. ZENO FRAGMENT 1]

The chapter of Zeno, reprinted with slight changes from *AJP* 63, 1942, 1–25 and 193–206, is easily the most important philological monograph published on the subject in several decades. It discusses all four of the Diels fragments and several other related texts. Even a bare summary of all the interesting ideas Fränkel propounds in this paper would exceed the limits of this review. Forced to select, I shall limit my comments to his treatment of B1.

The crucial problem for the translator is posed by the recurrent *autou*. Fränkel finds the right key in the invariance of the thought pattern at each of the three steps of the argument: the same point is made about the *hekaston* (sc. *tōn pollōn*: cf. Simplicius, *Phys.* 139, 16–17, and *ei polla estin* in the conclusion of the fragment) in the first period (hereafter: "1"), about the *proechein* in the second (hereafter: "2"), and finally, in the third ("3"), about every subsequent term, related to its predecessor as is the *proechein* at 2 to *hekaston* (*tōn pollōn*) at 1. So if the grammar mirrors the logic, all three genitives must have the same construction. But *autou* is clearly partitive at 3 and has always been so taken, to my knowledge. And a strong case can be made for the partitive at 1, for unless one takes it so the result is a mistranslation of ἀπέχειν αὐτοῦ τὸ ἕτερον ἀπὸ τοῦ ἑτέρου, as, e.g., in Lee (*Zeno of Elea*, Cambridge, 1936

Eleusismo, Rome, 1932 [hereafter: "Calogero"], 19), to which Fränkel also refers, requiring (*hossu noeis phasthai*) after *einai*, is more hazardous, and further from Fränkel's own translation of 8.34 (Fränkel informs me by correspondence that he now approves the sense of *noein* = *einai* for B3, but still finds the *te* puzzling.)

⁸ For some difficulties of *noēma hoti estin* as the sense of *houneken esti noēma*, see von Fritz, [introduced on p. 164] "*Nous, Noein*," 237–38; Verdenius, 39. I may add that in none of the other listings of *noēma* for Parmenides, Xenophanes, and Empedocles in the "Wortindex" to DK is the word so used that it would lend itself to introduce a that-clause.

[hereafter: "Lee"], 21), "and must be at a certain distance from another" (what happened to {*autou*} to *heteron*?), or in Diels-Kranz, "und Abstand der eine vom anderen haben" (what became of *autou*?), or else an excessively cumbersome one, as in Calogero (99), "si distingue da essa, come da altra, quella che rispetto ad esse e altra." But if *autou* is partitive at 1 and 3, it must be so at 2 as well. Heidel had suggested this construction already in 1913 (above, n.7, 724), but it had been generally ignored,⁹ probably because it had not been supported by the solid argument now provided by Fränkel.

This problem once solved, Fränkel proposes the following explanation of the reasoning:

1. Given any existent, it will have thickness or depth, as Zeno has just proved at B2, and will, therefore, have opposite surfaces or skins (a, b), separated by the interior depth (I) of the object. (The symbols are mine.)
2. But each of the skins is an existent and will also have a depth (same reason: B2) bounded by opposite skins. Thus b will have the skins c, d, separated by an interior, J, [195]
3. So too for every subsequent skin, and skin of a skin, there being no last. Thus d will have skins e, f, separated by K, and so forth.

At each step the depth of the object grows: if equal to I at 1, it will equal I + c + J at 2, I + c + J + e + K at the start of 3.¹⁰ The increase continues endlessly. But the increments grow ever smaller, and the outer extremity is never reached.

This is a first-rate interpretation, logically consistent and lucid, and with a picturesque charm all of its own. But I think the sense of *apechein* should be reconsidered. Must it mean 'to be at a distance from' as commonly understood? Liddell and Scott list also "project, extend," as, e.g., at Arist., *De part. anim.* 655a32, θαύεται γὰρ τὰ κραῦρα ταχέως ἐν τοῖς ἀπέχουσι: here *ta apechonta* are parts of the body like the nose and ears, clearly not "at a distance from (I) the body," but sticking out or projecting from it. And this, of course, is the normal meaning of *prochein* (to extend beyond something, though contiguous to it), which in this fragment must have the same sense as *apechein*; the *proechon* at 2 is none other than that part of the original existent which *apechet apo tou heterou* at 1. Putting this sense to work throughout the fragment, we get a drastic simplification of the reasoning, proceeding as above, but with two terms instead of three at each step. These are no longer surfaces or skins, for which unfortunately there is no warrant in the text, and we must bid a regretful good-bye to Fränkel's comical onion whose insides

⁹ Though R. Mondolfo, *L'Infinito nel Pensiero dei Greci* (Florence, 1938) 184, translates correctly; so too P. Albertelli, *Gli Eleati* (Bari, 1939), 206.

¹⁰ I am symbolizing only half the story, to simplify the exposition; the depth of the object is also growing in the opposite direction, sc. at the expense of skin a.

never manage to catch up with its outsides. What we have now are contiguous parts or regions, distinguished, τὸ ἕτερον ἀπὸ τοῦ ἑτέρου, but not separated by a third term, to which there is absolutely no reference in the text once the partitive construction of *autou* is applied.

On this interpretation, the reasoning is

1. Given any existent, it will have thickness or depth (B2) and will, therefore, have contiguous, non-overlapping parts or regions. Take two of these, a, b, which, between them, exhaust the object.
2. But each of these will have depth and, therefore, like parts or regions. Thus b will have parts c and d.
3. So too for every subsequent part, and part of a part, there being no last. Thus d will have parts e and f, and so forth.

Here again we get an endless increase by progressively smaller increments; starting with a at 1, we get a + c at 2, a + c + e at 3, and so forth. So this machinery does, more economically, all that Fränkel's is built to do. And its greater abstractness is also a point in its favor: the wording of the fragment is nothing if not austere.

We may turn now to the more important question of the connection of this reasoning with the concluding statement of the fragment:

Οὕτως εἰ πολλά ἐστιν, ἀνάγκη αὐτὰ μικρὰ τε εἶναι καὶ μεγάλα:

[A] μικρὰ μὲν ὥστε μὴ ἔχειν μέγεθος.

[B] μεγάλα δὲ ὥστε ἄπειρα εἶναι.

[B], to begin with:

It is obvious that this could not be thought to follow from the above reasoning except on the assumption that the sum of the infinite series (I + c + J + e + K + . . .), on Fränkel's construction (a + c + e + . . . , on mine) is infinitely large. Fränkel explodes a minor bombshell by maintaining that Zeno knew this assumption was fallacious and used *apeira* only in the sense of "unbestimmt" (not "unendlich"), thus propounding a technically correct but intentionally misleading conclusion. If sustained, this would alter our picture of Zeno. We would have to see him as a "Doppelcharakter," a profound and subtle philosopher who is also a master of verbal legerdemain and uses it with aplomb and gusto when he needs it to win an argument; well aware "der Schwere und Tiefe seiner Probleme . . . , aber beim Umgang mit ihnen narrt und verblüfft er den Leser mit munterem, keckem Übermut" (236). I cannot assess here in detail the [196] historical merit of this portrait which Fränkel perfects with delightful artistry as he moves from fragment to fragment. I will merely venture the opinion that Zeno, the virtuoso of the art of dialectical *ekplêxis*, has never been depicted more convincingly; but that this dazzler is

also a buffer and a trickster, remains to be proved. I do not find it proved in the present instance.

Here the weakest of Fränkel's contentions is that Zeno had "technisch" (231; cf. 226ff.) the right to infer from the above reasoning that the size of the existent is indefinite. Even if we were to concede the use of "indefinite" for *apeira* at [B], he would still have absolutely no warrant to deduce that the size of the existent is indefinite. Whatever size the existent possessed at *I* to begin with (say, that of a one-inch cube), it would continue to have throughout the subsequent steps of the reasoning; for the emergent parts arise from purely logical divisions (cf. Fränkel at 201, and Plato, *Parm.* 165a, *labēi tēi di-anotai*), not physical ones, else the cutter would quickly run out of sharp enough blades, and the *eschaton* would be reached only too soon. Hence the size of the existent would be unaffected by the reasoning: it would remain as definite (and definitely the same) whether regarded as one integral inch or as the sum of a million millionths of an inch or as the sum of the infinite series prescribed by Fränkel's (or any other) construction of the reasoning in this fragment. For this reason, to infer that the size of the existent would be "unbestimmt" would be technically as fallacious as to infer that it is "unendlich."¹¹ Hence we would have as good grounds to debit him with the latter inference as with the former, indeed better grounds: We know that the crucial assumption that would lead to the latter inference (*sc.* that the sum of any infinite collection of finite magnitudes must be infinitely large) persisted¹² even after the theorem, amply sufficient to explode that assumption, that no finite quantity can be exhausted by a progression decreasing in constant ratio (Arist., *Phys.* 206b7–9), had become a matter of common knowledge. Is it unreasonable to think that Zeno, in the middle of the fifth century B.C., might make a mistake that Simplicius was still making in the sixth A.D.? Where, contrariwise, is there a record of a corresponding assumption, sufficient to account for the inference Fränkel imputes to Zeno?¹³ Thus, whatever we might think of the general proposition that the defender of the Eleatic faith could resort to deception (even in fun), this particular case, judged on its own merits, favors the conclusion that Zeno was honestly misguided rather than wilfully misleading.

What of [A]?

Coming where it is, close upon the heels of a tight, eventful, argument, one's first impulse is to take it as an inference from the reasoning in the

immediately preceding lines. Several modern commentators have so taken it. Fränkel, following Zeller and Calogero, takes it instead as a simple but artfully phrased inference from Zeno's previously established conclusion that no existent has size. He grounds this important and difficult decision on both the testimony of Simplicius and the evidence of the fragment.

Simplicius' main relevant statement is at *Phys.* 139, 16–19. Heavy stress has been rightly placed (Calogero, 104; most recently N. Booth, ("Zeno's Paradoxes") *JHS* 77, 1957, (pp. 198–201 at) 200) on its second half: *ὁ δὲ δεικνύει προδείξας ὅτι οὐδὲν ἔχει μέγεθος ἐκ τοῦ ἑκάστων τῶν πολλῶν ἑαυτῷ ταῦτόν εἶναι καὶ ἓν*. But *ho deiknusi* obviously refers to the immediately preceding *ὅτι μέγεθος ἔχει ἑκάστων τῶν πολλῶν καὶ ἀπείρων τῷ πρὸ τοῦ λαμβανομένου ἀεὶ τι εἶναι διὰ τὴν ἐπ' ἀπείρων τομήν*. This Fränkel (214, 224¹) rightly takes to have referred to our B1: *πρὸ τοῦ λαμβανομένου ἀεὶ τι εἶναι* is obviously modeled on *προέξει αὐτοῦ τι* of our fragment (Simplicius anticipating the modern misconstruction of *αὐτοῦ*). Thus if we take Simplicius' testimony in its context (139, 7–19), his account may be paraphrased as follows: [197] Zeno, intent on showing the contradictory consequences of *ei polla estin*—*sc.* that they must be both infinitely large [B], and "so small as to have no magnitude" [A] (lines 7–9)—argued that, to exist, the *polla* must have magnitude (B2) (only) in connection with his proof of [B], where infinite divisibility presupposes that "each of the infinitely many"¹⁴ has size (lines 9–18); this proof having been preceded by the demonstration that none of them has magnitude (lines 18–19). Since Simplicius' *ouden echei megethos* at line 18 all but repeats his earlier *mēthen echei megethos* (line 9), there can be no reasonable doubt of his implying that his lines 18–19 refer to Zeno's proof of [A].

Simplicius' testimony gets some confirmation from the text of B1 itself, which states so very explicitly *οὐδὲν γὰρ τὸ τοιοῦτον ἔσχατον ἔσται*. For null size could not be inferred for the existent unless it had been inferred for each of its parts, and in that case the series of *proecheonta* would have an *eschaton* after all (cf. Frankel 202). Thus those who think that [A] was derived from the reasoning in B1 itself must either assume that Zeno makes a logical gaffe at this point, or else that he expects his reader to supply the

¹¹ That the depth of the existent is growing outward without ever reaching the outermost *peras* means simply that the series of increments is "unendlich," whence Zeno could not validly infer that the sum of the series is "unbestimmt."

¹² Epicurus, *Ep. ad Hdt.* 57, Eudemus ap. Simplicius, *Phys.* 459, 25–26 (= fr. 62 Wehrli); Simplicius, *Phys.* 142, 14; 168, 34–169, 1; 459, 23–24; 460, 2–4, 462, 3–5.

¹³ Nothing of the kind in Arist., *Phys.* 206b34 (cf. Frankel, 227), where *apeiron* means "infinite," as also at 206b7ff.

¹⁴ τῶν πολλῶν καὶ ἀπείρων, Frankel's brilliant emendation of the last word, *apeiron* (214), would be a vast improvement in the sense. But I am uncertain that this more elegant turn of phrase is quite in line with Simplicius' style. Nor would I wish to tie the probative value of Simplicius' sentence for the point at issue here to the acceptance of the emendation—Fränkel also maintains (215) that Simplicius' introductory clause (*καὶ ταῦτα οὐχὶ τὸ ἐν ἀναιρῶν ὁ Ζήνων λέγει*) has no connection with what precedes. But the phrase simply calls the reader's attention to the fact that Zeno's refutation of the unextended (B2, the reference of *tauta*) does not refute "the One" (which Simplicius believes to be unextended), but only the *polla* of the hypothesis. There is some clumsiness in Simplicius, but (given his apologetic interests) no evidence of confusion or misunderstanding.

peccant premise.¹⁵ Neither assumption is plausible, but we could not safely rule them both out if we had evidence elsewhere in our fragments or testimonia that Zeno employed, or even showed a penchant for this type of reasoning—the deduction of nullity of size from infinite divisibility.¹⁶ Hence the importance of Fränkel's observation (202 and n.1) that the notion of the infinitesimal—that slippery character that sneaks in between the contraries "extended," "unextended," and *might* have misled Zeno to think that infinite subdivision would eventuate in terms having negligible quantity, hence no quantity at all—does not show up in any other surviving sample of Zeno's reasoning; even "infinitely small," (cf. *apeira* . . . *smikrotēta*, Anaxagoras B1), that could have led him to the confusions of the infinitesimal (though it did not so mislead Anaxagoras: cf. his B3) is never employed by Zeno¹⁷—a point previously stressed by Calogero, 106. [198]

There is only one supposed Zeno fragment (Porphyry *apud* Simpl., *Phys.* 139, 24–140, 18)¹⁸ which argues that infinite divisibility would ultimately reduce existents to unextended parts. Fränkel (202) has some good remarks against Zenonian authorship for this text. To these I may add two:

(a) Simplicius' remark, "It is worth considering whether this argument—which he has just finished citing from Porphyry, who ascribed it to Parmenides—is really Parmenides', and not, as Alexander thinks, Zeno's" (140, 23), is not supported by any reason other than "that most of our information refers to puzzles from dichotomy to Zeno";¹⁹ this would be consistent with the exis-

¹⁵ So, e.g., P. Tannery, *Pour l'histoire de la science hellène*, Paris 1887, 254–55. Zeno is supposed to reach the conclusion at 3 and then, adding the premise (his interlocutor's), "there is a final element," deduce [A] It is not clear whether Zeno is supposed to (I) be unaware of the fact that this new premise explicitly contradicts what he has just proved at 3, or (II) see this and, operating with a set of premises which includes side by side two explicit contradictories, produce a conclusion which will impress his opponent. Either alternative calls for more than ordinary stupidity—(I), on Zeno's part and (II), on his interlocutor's.

¹⁶ As, e.g., at Arist., *De gen. et cor.* 316a15ff (probably Democritean) and 325a8–12 (probably Melissean; cf. the immediately preceding polemic against a vacuum with Melissus B7, 7–10); Epicurus, *Ep. ad Hdt.* 56 (cf. Lucr. 1, 746–56). But note that this argument does not occur at Plato, *Parm.* 165ab, to which Fränkel (203, 228) rightly refers as offering some parallelism to Zeno B1: in spite of some verbal similarity to the one at *De gen. et cor.* 316a15ff. (*apeiros hē thrupsis* at b31; *thruptesthai kermatizomenon* at *Parm.* 165b), the conclusion of the Platonic argument is *not* reduction to extensionless elements.

¹⁷ Though often enough in modern explanations or paraphrases, e.g., H. Jackson, article "Zeno," *Enc. Brit.*, 11th edition; W. D. Ross, *Aristotle's Physics*, Oxford 1936, 479; H. von Arnim, "Die europäische Philosophie des Altertums," in *Kultur der Gegenwart*, 2nd ed., Leipzig, 1923, 110; R. Mondolfo, (above n.9), 182.

¹⁸ Printed as fr. 2 in Lee.

¹⁹ Lee thinks Simplicius "clinches his argument" [*sc.* for the Zenonian authorship of the Porphyry text] by quoting B3 (*Phys.* 140, 29ff.) "as being sufficiently similar to the argument in question to justify him attributing it to Zeno." But the subject of *phēretai* at 140, 27, the same as that of *apomēmoneuetai* just before, is the *ek tēs dichotomias aporia*, 140, 24, *not* the Porphyry text

tence of several original arguments from dichotomy by early writers other than Zeno, and for any number of later pastiches.²⁰

(b) Contrariwise, there is internal evidence against ascribing this text to Zeno, not only the style ("durchaus unzenonisch," as Fränkel observes, *loc. cit.*) but also the fact that it argues constructively for the Eleatic thesis that Being is One and indivisible, after the manner of Parmenides and Melissus, not destructively against a non-Eleatic thesis, which is the only thing Zeno did when arguing on plurality according to both our primary and secondary evidence (B1, B3; Plato, *Parm.* 127e ff., *Simp.*, *Phys.* 139, 5ff.; 141, 10).

So with a sigh of relief we may exonerate with Fränkel our clever Zeno from the allegation that he offered [A] as a deduction from premises in our B1, as some of his modern admirers have believed.²¹

Thus, to sum up the estimate of Zeno's performance in B1: a lucid logical argument at 1, 2, 3; also dramatic, even humorous, on Fränkel's construction; colorless, elegantly spare, on mine. The conclusion at [B]: no fallacy, but a trick, on Fränkel's reckoning; no trick, one fallacy, on mine.

[III. ANAXAGORAS FRAGMENT 4A]

The paper on Anaxagoras—review of Ciurnelli, "La Filosofia di Anaxagora," Padua, 1947, reprinted here with substantial enlargements from *CP* 45, 1950—is one of the shortest pieces of the book, sharply focused on a single problem arising from a single fragment. But its length is no index of its weight, for it is the best contribution ever made to the long-standing debate on whether Anaxagoras did or did not believe in a plurality of worlds. It is a fine sample of what can be done toward the solution of a difficult problem "durch eine genaue grammatische Überprüfung des Fragments" (228).

Though the ascription of the one-world view had the clear support of Aristotle and Simplicius,²² it seemed flatly incompatible with Anaxagoras' [199] words in B4a,²³ particularly its concluding sentence: ταῦτα μὲν οὖν μοι λέλεχται περὶ τῆς ἀποκρίσιος, ὅτι οὐκ ἂν παρ' ἡμῖν μόνον ἀποκριθεῖν,

Which I suppose it to be, modeled on the arguments at *De gen. et cor.* (n 16 above), to which it bears some striking similarities or, on their sources.

²¹ Tannery (above, n.15). T. L. Heath, *History of Greek Mathematics*, I, Oxford, 1921, 275.

²² Arist., *Phys.* 250b21–26, the terms of the disjunction, (I) ἐν ᾧ ἢ (II) μὴ ἀεὶ, are taken up respectively in ἡ γὰρ (I) ὡς Ἀναξαγόρας λέγει . . . ἢ (II) ὡς Ἐμπεδοκλῆς . . . (Cf. H. Cherniss, *Aristotle's Criticism of the Presocratics*, Baltimore, 1935, 174). *Phys.* 187a24–25 is not unambiguous for our issue. Simplicius, *Phys.* 178, 25; 1121, 21. More on Simplicius, below p. 177.

²³ So Fränkel tags the first twelve lines of DK¹ 59B4, showing (287) that there is no good reason to assume continuity with the rest of B4.

ἄλλα καὶ ἄλλη. So the one-world view seemed doomed, unless some way could be found to explain away its *prima facie* contradiction with the fragment.

Several such explanations were proposed, each offering some convenient location within our own world for the *allēi* of the fragment: other parts of the earth (F. M. Cornford, *CQ*, 28, 1934, 6–9; cf. *Simpl.*, *Phys.* 35, 9–13); the moon (E. Zeller, *History of Greek Philosophy*, 2, Engl. transl. of first German edition, London, 1881, 359 and notes (same view in 6th German edition, Berlin, 1920, 1–2, 1239); cf. Diogenes Laertius 2, 8, and DK⁵ 59A77); the moon and other planets (O. Jöhrens, “Die Fragmente des Anaxagoras,” *Diss.*, Essen, 1939 [hereafter: “Jöhrens”]).

It is not necessary to go into details on the several merits of these theories, for they all share one feature which is sufficient to condemn them *en bloc*: all three proceed on the tacit assumption that what is being said to exist *allēi* in this fragment is a human civilization as such. But no one has proposed that the subject of *apokritheîē* is [*hē oikēsis*], from *tēn oikēsin* of the preceding sentence. The usual translation, as in DK⁵ “. . . die Abscheidung, daß sie nicht nur bei uns stattgefunden haben dürfte . . .,”²⁴ recognizes (*hē apokrisis*) as the subject.²⁵ But even if we take some unspecified term, like (*ta onta*) to be the subject (so Burnet, *Early Greek Philosophy*,⁴ London, 1930, followed by Cornford, *apokritheîē an* = “things are separated off”), the sense would not be different, since the “things” in question would be all those produced by the cosmic *apokrisis*: not just animals, men, and human works, but earth, sun, moon, etc. If there is any uncertainty about this, it is created only by the violently foreshortened, man-centered, perspective in which the whole cosmic process is viewed: sun, moon, stars,²⁶ and earth are mentioned only as existing for men, i.e., for human uses (cf. Fränkel, 285ff.). But this in no way affects the fact that man and his culture are themselves regarded as the product of the cosmogonic process. This is clear enough from the use of *apokrisis*, which we know to be the key concept of Anaxagorean cosmogony (B2, B4b, B9, B12, B13, B14, B16). If further reassurance were needed of the cosmic reference of *apokritheîē* in our sentence, it may be found in the opening sentence of the fragment, seen in its close syntactical ties to all the succeeding ones down to the start of the last sentence. In grammatical form these first ten lines of the fragment are one of the most tightly connected sentence-sequences

²⁴ So too most recently Raven in (G. S. Kirk and J. E. Raven, *The Presocratic Philosophers* (Cambridge, 1957)), 389. Same translation followed by Jöhrens, 33, who seems unaware of its bearing on the reference of the *allēi*.

²⁵ For subject-verb duplication, cf. B12, “. . . τῆς περιχωρήσιος . . . ὥστε περιχωρήσαι τὴν ἀρχήν: “. . . the rotation, so that it began to rotate in the beginning,” Raven (above, n.24), 372. DK⁵ translates, “. . . so daß er (der Geist) dieser Umdrehung den Anstoß gab,” as though *perichōrein* could be active.

²⁶ The obvious sense of the last word in ἡέλιόν τε . . . καὶ σελήνην καὶ τὰ ἄλλα, here, cf. τὰ τε ἄστρα καὶ ὁ ἥλιος καὶ ἡ σελήνη at B12.

in the whole of Presocratic prose: their five infinitives (*eneinai*, *sumpagēnai*, *einai* bis, *phuein*) are all governed by *chrē dokein* at the beginning (Fränkel, 290).²⁷ The first of these dependent sentences (the *eneinai*-sentence), a strictly cosmological (not anthropological) observation, fixes at the start the cosmological context of the four ensuing, grammatically parallel, remarks about the origin of animals, men, and civilization.²⁸ Once this is granted, and the cosmic significance of *apokrisis* and *apokritheîē* is clearly understood, the problem of the reference of the *allēi* solves itself: the only thing under [200] consideration here is another cosmic *apokrisis*, proceeding, like ours, to issue in a like world.²⁹ This kills all three of the proposed theories at one blow and leaves us with no alternative to the many-world view for Anaxagoras, unless an entirely new way can be found to reconcile the one-world doctrine with our fragment.

This is just what Fränkel has now given us. We are to construe the optative with *an* as a pure potential abstracting rigorously from the actuality, or even from the material possibility, of what is asserted. And we are to understand Anaxagoras to be saying that if certain basic conditions are fulfilled (those laid down by his cosmogony, and referred to in *toutōn de houtōs echontōn* at the beginning of the fragment), the *apokrisis* was bound to get under way and run through all its stages down to the very last in which we live. One way of saying this would be the very one used here: “(once these conditions were fulfilled,) the *apokrisis* would have occurred ‘elsewhere too.’” Fränkel shows how close this comes to the living forms of the spoken language, e.g., in Homer: τί κεν ῥέξειε καὶ ἄλλος, *Od.* 4, 649, has the same construction with *another person*, instead of *another place*, to help carry out the syntactical manoeuvre for making a generalized statement for a particular case. “What would anyone have done, if someone like Telemachus, so care-burdened in spirit, had begged a favor of him,” is a good way to say, “Given the circumstances, I could not have done otherwise.” That the optative expresses a pure potential is clear, since the question of the physical possibility of what is asserted in the protasis is irrelevant: had it been quite impossible for Telemachus to go to anyone but Noemon in his need with his request, Noemon could still have said later exactly what he is saying now.³⁰ On this explanation the absolutely unlocalized *allēi*, whose vagueness is so embarrassing for the forementioned theories (why, e.g., did not Anaxagoras say “on the moon,” if

²⁷ On this ground alone we may rule against Jöhrens’s suggestion (31) of a gap between the *eneinai* sentence and the *sumpagēnai*-sentence in the text available to Simplicius.

²⁸ Cf. Fränkel, 291ff., and Jöhrens’s 33, but I think they overstress the significance of the *sun-* (rather *sunkrinomenois*) in terms like *sunōikēmenas* and *sunenenkamenoi*.

²⁹ This, I think, is the point of Simplicius’ objection to “other places on the earth” for *allēi* at 35, 11–13, but he doesn’t express it at all clearly.

Beautiful examples of the extreme of physical impossibility to which the protasis of an optative with *an* will go, at Fränkel 228 “if this house could speak,” etc.

that is what he meant?), becomes perfectly luminous: no vagueness here, but studied generality, a simple, informal way of expressing the abstract and formal notion of "any alternative situation realizing the same conditions."

I see no harm in calling this with Fränkel (289) a "Gedankenexperiment," so long as it is clear that all it does is to project an ideal experiment, not to perform it, and for that very reason (as Woodbury has acutely observed in his review)³¹ cannot offer the least proof of Anaxagoras' cosmological theory. In this respect the commonsense example from Homer is quite different: there the ideal experiment can come off after a fashion, as one particularizes the general statement in the imagination ("What would I have done? What would Jones have done?"), reconstructing particular answers from one's knowledge of particulars and thereby getting some sort of case by case confirmation (or disconfirmation) of the asserted proposition. Unfortunately nothing of the sort is feasible in pursuit of Anaxagoras' grandiose claim that his *apokrisis* would start rolling on its one-track course once Mind got to work on a primordial mixture of the correct, Anaxagorean, specifications. What is there to make us think that if these conditions were duplicated, duplicate consequences would follow? Nothing but our anterior confidence in Anaxagoras' theory. If we have reason to doubt the theory, we would have exactly the same reason to doubt that the predicted consequences would occur in Cosmic Experiments A, B . . . N. Hence if Anaxagoras thought that what he said in B4a confirmed his theory he would be wrong. But this in no way damages Fränkel's construction of the text, nor does it reflect the least discredit on Anaxagoras, for we need not (indeed, cannot, with any support from the text) saddle him with the supposed blunder. All we can get from the text, on this construction, is the assertion, not the verification, of Anaxagoras' claim that the cosmic antecedents named in his theory were the necessary and sufficient conditions of all that came thereafter, from sun to horticulture. [201]

But we have yet to look at the construction of the five preceding infinitives. If these too are conditional, why is not each of them accompanied by *an*? Fränkel replies (290–91) that the earliest Greek—with which Anaxagoras' "schwerflüssiger" style has marked affinities—does not use the *an* with the infinitive; and that this *an* was dispensable even in classical Greek. The weight carried by the *an* in the concluding period is borne by the *dokein* of the introductory sentence. Fränkel rightly insists on the difference between saying *chrē eneinaī, sumpagēnai*, etc., and *chrē dokein* ("we must suppose," Raven (above n.24)) *eneinaī, sumpagēnai* . . . ; the latter presents the states or events named by the infinitives as consequences of the hypothesis *ioutōn de houtōs echontōn*. The result is admittedly a clumsy construction. In a more skilful stylist, the resulting harshness in this first and longest part of the fragment would be sufficient to condemn Fränkel's interpretation of the whole.

³¹ Cf. n. 1 above

But anyone who has struggled with Anaxagoras' obscure, sometimes barely intelligible, Greek in other fragments will not be swayed by this one consideration. For what is the alternative? It is to revert to the older construction of *apokritheīē an* in the last sentence ("Optativ der gemilderten Behauptung," 288). Fränkel's query ("Man darf wohl fragen ob eine solche Urbanität des Ausdrucks . . . dieser frühen Lehrschrift gemäß ist," *ibid.*) is only one of the objections to this. For if Anaxagoras did intend to propound the doctrine of multiple worlds, (I) he would have had more to say on the topic than what he says in this one fragment and (II) would not have spoken as he does in certain other fragments.

(I) The premise here is Fränkel's observation (288n. 1) that this was the only text in which Anaxagoras had spoken of another *apokrisis*; for if Simplicius had found any other statement of the kind, he would have quoted or alluded to it at *Phys.* 35, 9–21 and 157, 5–24, where he is in urgent need of all the data bearing on this difficult problem. But it is most unlikely that Anaxagoras would have made this one text, so oblique and indefinite for this purpose, the sole vehicle of his declaration for multiple worlds, had he subscribed to this important doctrine.

(II) In B14 (Diels' text) Mind is *ἵνα καὶ τὰ ἄλλα πάντα*: here τὰ ἄλλα πάντα = (a) (τὰ) ἐν τῷ πολλῷ περιέχοντι + (b) (τὰ) ἐν τοῖς προσκριθείσι καὶ ἐν τοῖς ἀποκεκριμένοις; but all the items of (b) are products of the *perichōrēsis*, always in the singular (B12, B13), and always the one that produced *our* world. Had Anaxagoras believed in one or more other worlds, we could expect some verbal qualification, however, slight, in statements such as this, and even more so at B12, DK, 38, 10–12, where the *panta* of the expression *panta diēkosmēse nous* (through the *perichōrēsis*) is expanded into καὶ ὅποια ἦν, . . . καὶ ὅσα νῦν ἔστι καὶ ὅποια ἔσται, a clear equivalent of the traditional τὰ τ' ἐόντα τὰ τ' ἐσσόμενα πρὸ τ' ἐόντα (Hesiod, *Th.* 38; cf. Empedocles B21, 9, Democritus A39 [= *Dox. Graeci* 581, 11]).

The inference I am drawing here from (I) and (II) is strengthened by the knowledge that Aristotle and Simplicius,³² who had read so much more of Anaxagoras' own work, were left with the conviction that he adhered to the one-world doctrine. Here I must deal with one statement in Simplicius which has been recently (Raven, (above, n.24) 390) taken to imply that he was uncertain of Anaxagoras' stand on this issue. This is the remark with which Simplicius winds up his discussion of B4a at *Phys.* 157, 5–25, ἀλλὰ ταῦτά εἴτε οὕτως εἴτε ἄλλως ἔχει, ζητεῖν ἄξιον. That this voices some residual uncertainty³³ is obvious. But what about? Probably not about Anaxagoras'

³² I omit the usual reference (also in Fränkel, 288) to *en tōi henī kosmōi*, B8, since in this context *henī* seems to refer to the world's internal unity, not its uniqueness; cf. *hers* of each citizen, *mia* of the state. Plato, *Rep.* 423d

³³ But not of the proportions suggested by Raven's translation of the cited sentence, "But it is debatable whether or not these considerations are valid."

partisanship of the one-world doctrine, since he ascribed this to him without qualification elsewhere.³⁴ It may concern the adequacy of his refutation of the view he has just discussed in the immediately preceding (20–24) lines;³⁵ this would imply no doubt about Anaxagoras' [202] adherence to the one-world doctrine, for this view (*allēi* = "other settlements" [on the earth: cf. 35, 11]) is simply a variant of that doctrine. But it is more likely to concern his own (Simplicius') explanation of the apparent discrepancy of this passage with that doctrine, since he assumes (as have all modern commentators prior to Fränkel's suggestion) that B4a does assert the existence *allēi* of some counterpart to what exists *par' hēmin*.³⁶ He says this means a *noera diakosmēsis*, but without being wholly satisfied that this is the literal sense of the text (hence the *ainittetai* at line 17). He is more complacent in the *De caelo* (609, 3–12): the same explanation, without the least sign of wavering.

Two last, more general, points: Could it be argued that the one-world doctrine would not comport with (a) Anaxagoras' view of the infinity of the material matrix, and (b) what has been recently called his "principle of all in all"?³⁷ I think not. The latter principle in Anaxagoras is *en panti pantos moira* (B11, B12). Whatever may be the meaning of this difficult sentence, on no interpretation known to me would it fix, directly or by implication, the number of worlds in existence; on any of the current views, it would be as compatible with the existence of one world as with that of an infinite number. Had Anaxagoras traveled farther along the road of infinity, he might have glimpsed the enchanting prospect of a world in every seed, and so worlds within worlds ad infinitum, matching or bettering Leibniz's doctrine that "each portion of matter may be conceived as like a garden full of plants and like a pond full of fishes; but each branch of every plant, each member of every animal, each drop of its liquid parts is also some such garden or pond" (*Monadology* 67). Anaxagoras' imagination took him far, but not so far. As for (a), the atomists drew just that inference from the infinity of matter, but the general principles by which they derived it were those of a mechanistic physics, postulating a chance distribution of worlds throughout infinite space, with chance variations in size and structure.³⁸ It would be otherwise for Anaxagoras, where

³⁴ See n.22 above.

³⁵ That it concerned the view discussed still earlier (lines 17–20) seems unlikely, for his refutation of this view is very strong (cf. Jöhrens, 31–32); but even if his certainty did spread also over this part of the discussion, it would still not imply uncertainty over Anaxagoras' partisanship for the one-world doctrine, which would be contradicted only by multiple *concurrent* worlds (cf. *Phys.* 1121, 12ff.).

³⁶ His reading must have been influenced by the fact that *par' hēmin* is a standard Platonic expression (eight times in *Parm.* 134) for the sensible world in contradistinction to the ideal, the same dualism Simplicius is bent on clamping on Anaxagoras here, as earlier at 35, 9ff., and at *De caelo* 609.

³⁷ Woodbury (above, n. 1).

³⁸ Hippol., *Ref.* 1, 13, 2–3. I once suggested ("Ethics and Physics in Democritus") *PR* 55.

Mind, not chance, would decide. Would Mind prefer two worlds, or a whole infinity, to just one? Yes, possibly, if they were different. But those of B4a would have to be all alike. It is not likely that Mind would choose to engage in cosmic mass-production.³⁹ [203]

I cannot close without reminding the reader of two things: First, of the small portion of the book (barely forty pages out of more than three hundred) that I have managed to discuss in this review, ignoring, for lack of space, many ideas matching in interest those I have considered. This should convey some sense of the enormous wealth of highly concentrated material contained in this volume. Second, I have spoken almost exclusively *ad rem*, arguing the pros and the cons of Fränkel's ideas, but with hardly a word about the method by which they are reached and the form in which they are presented. Of these all I can say now is that I know of no better model of precise, imaginative, and sympathetic interpretation of classical texts; and that the style, fastidious but never fussy, compressed and workmanlike but often delighting the ear with its rhythms and the eye with its imagery, is itself a thing of beauty.

1946, 53 (**1.341)) that Democritus' doctrine here that some worlds have neither sun nor moon might be part of a polemic against Anaxagoras' anthropocentric universe; Kirk (above, n. 24), 414n 6 calls attention to *par' hēmin* here, as in B4a. The point of that earlier suggestion would not be blunted in the least by Fränkel's construction of the fragment. The atomists would have as good reason to challenge the declaration that another *apokrisis*, if it occurred, would have sun, moon, etc., or, for that matter, men.

³⁹ C. Strang reports, and endorses, the opinion of G.E.L. Owen that H. Fränkel's interpretation of the first part of B4a as a Gedankenexperiment "can hardly survive the indicative *chrōntai*" in the penultimate sentence ("The Physical Theory of Anaxagoras," *AGP* 45 [1963], 101ff., at 115n 28). Certainly, the indicative is surprising on Fränkel's interpretation and, if Anaxagoras had been a writer of deft prose, this might well have constituted a conclusive objection.

RAVEN'S PYTHAGOREANS AND ELEATICS

RAVEN OFFERS US in this book a study of the interaction between the Pythagoreans and the Eleatics which enables us, he thinks, to reconstruct the evolution of Pythagorean thought throughout the fifth century and into the early fourth.¹ His main sources are Aristotle and the Fragments of the Eleatics. He also makes some use of later sources, especially Alexander Polyhistor *apud* Diogenes Laertius 8, 24ff. This last, he holds (pp. 161ff.), following Wellman (M. Wellman, "Eine pythagoreische Urkunde des IV Jahrhunderts v. Chr.") *Hermes* 54, 1919, 225–48), preserves in the main a source contemporary with Plato; he seems unaware of Festugière's study (Les 'Memoires pythagoriques' cités par Alexandre Polyhistor") *REG* 58, 1945, 3–65ff.) which argues convincingly that this source is definitely post-Platonic. In the case of Aristotle, Raven's starting point is *Met. A. 5*, 985b23–986a8, a passage which, he holds "explicitly recognizes a distinction between one school or generation of Pythagoreans and another" (p. 11). He bases this view on the fact that Aristotle's first account of Pythagorean doctrine in *Met. A. 5* (985b23–986a21) is introduced with the words "contemporaneously with these philosophers (the atomists) and before them, the so-called Pythagoreans . . .," while the Table of Opposites in the second account (986a22ff.) is ascribed to "others of these same people," i.e., other Pythagoreans, who are said to have either derived this doctrine from Alcmaeon or else were the source of Alcmaeon's alternative doctrine of opposites. If this inference could be sustained, it would give us a historical basis of capital importance for our reconstruction of the evolution of fifth-century Pythagoreanism. Unfortunately, it cannot. For Aristotle's first account is by no means *restricted* to Pythagorean views contemporary with atomism, since the introductory statement {166} reads, ἐν δὲ τούτοις, καὶ πρὸ τούτων. Moreover, the immediately following phrase speaks of the "so-called Pythagoreans" as those "who were the first to make up mathematics"; this shows that Aristotle is talking about a group which *includes* the very first generation of

Pythagoreanism. To be sure, neither can we infer from this that *all* the views of the first account are projected to the first generation of Pythagoreanism. All we can gather from the all too vague chronological tags of this first account is that Aristotle is thinking of the fifth-century Pythagoreanism *en bloc*, describing the general doctrine which he thinks characteristic of the school so considered, even though he feels free to {29} illustrate one of the peculiarities of this worldview by an example (that of the counter-earth at 986a11) which is doubtless from a later generation.

This leaves us with the question as to just how early, in Aristotle's view, is the Decalogue of the Opposites of the second account. All we can get out of Aristotle here is that for all he knows, it may have come either earlier or later than Alcmaeon. Faced with this explicit indecision in Aristotle, and uncertain as to the date Aristotle would assign to Alcmaeon (The Bekker text of 986a29–30 is almost certainly corrupt; see Ross (*Aristotle's Metaphysics* (2 vols., Oxford 1929)) *ad loc.*, and W. A. Heidel, 'The Pythagoreans and Early Greek Mathematics', *AJP* 61, 1940, 1ff., at pp. 4–5), we cannot assume without further evidence, as Raven seems to do, that the whole Table of Opposites is pre-Parmenidean. What we have to ask ourselves is this: Are there any items in this Table which Aristotle could *not* have thought Pythagorean borrowings from Alcmaeon? This question, not raised by Raven, admits of a reasonably definite answer. We can say that, at least, the first two items of the Table, the *Peras-Apeiron* and Odd-Even contrasts, could not have been regarded by Aristotle as derived from Alcmaeon, since (1) these are not present in the oppositions which Aristotle ascribes to Alcmaeon at 986a33–4 and are generally foreign to Alcmaeon's thought (nothing of the kind, e.g., at Alcmaeon B4), while (2) at 987a13ff. Aristotle says that the view that the Finite-Infinite are not "attributes" of things but their "substance" is peculiar (*idion*) to Pythagoreanism. We can thus hope to salvage the *Peras-Apeiron* and its corollary, the Odd-Even, as original features of Pythagorean thought, a gain of the greatest value in this chapter of Greek thought where anything worthy of the name of evidence is so {167} hard to come by. Unfortunately this line of reasoning fails us if we seek to establish the primitiveness of *all* items of the Table of Opposites, and Raven is unjustified in assuming that this whole Decalogue outlines a coherent system of Pythagorean doctrine from which Parmenides "dissents" in his Poem.

This brings us to Raven's assumption, which he shares with so many others, that the Eleatics can be used as sources of Pythagorean doctrine, construing some of the major developments in the two schools as the result of a running debate between them. Of Parmenides he writes "Concentrating his thought upon the principles of Unity, he came to believe that the Pythagorean usage of that principle was in defiance of reason. If Unity be postulated as ultimate principle, then, he maintained, there can never be anything else but Unity" (p. 176). I find nothing in the fragments to justify this account. As

From *Gnomon* 25 (1953): 29–35. Reprinted in Furley and Allen II, pp. 166–76. Used by permission. Note numbers are those of the reprint. Minor changes to spelling and punctuation have been made. (Note: in the reprint the editors seem to have missed words italicized in the German style of spacing letters out, italics have been restored.)

{Pythagoreans and Eleatics. An Account of the Interaction Between the Two Opposed Schools During the Fifth and Early Fourth Centuries B.C. (Cambridge University Press, 1948). This review is reprinted with two additional notes marked by braces.}

Cherniss retorts in a brief but important review of Raven's book (PR 99, 1950, 375ff.), "it is not from Unity that Parmenides begins but from Being." Raven would have done better to limit his comparison of Parmenidean with Pythagorean doctrine to just those parts of Parmenides' poem which employ terminology that can be reasonably considered Pythagorean. The most striking of these is the repeated and emphatic use of *peiras* at B8.26, 31, 42 (cf. also *ouk ateutēton* at B8.32). Here is something which *can* be made a probable [30] link with Pythagoreanism, but only because, as I have argued, we have good reason to think of the *Peras-Apeiron* contrast as an original feature of Pythagorean thought. The occurrence of rest-motion and light-darkness in the Table of Opposites is another possible link, but one which raises the question whether Parmenides here is borrower, source or, for that matter, neither—a question which is not even considered by Raven. Another link, and a far surer one, whose importance requires a very different treatment from the bare mention given it by Raven (23), is the fact that Parmenides gives his doctrine the guise of a religious revelation. Here above all is a striking parallel with Pythagoreanism which, in its origins, was nothing if not a religious revelation (see my "Theology and Philosophy in Early Greek Thought" PQ 2, 1952, 110ff. (**1.17ff.)). In all this there can be absolutely no question of treating the fragments of Parmenides as evidence, direct or indirect, for Pythagorean views. All we can do is to examine possible affinities between the text of Parmenides {168} and what, on other evidence, may be reasonably considered Pythagorean doctrine.

The same may be said of Zeno, whose alleged anti-Pythagorean intent is, in my opinion, a modern fabrication: I would say with Heidel ("The Pythagoreans," at p. 21), "there is not, so far as I know, a single hint in our sources that the Greeks themselves were aware of the purpose of Zeno to criticize the fundamental doctrines of the Pythagoreans." Raven ignores this paper of Heidel's, as also Calogero's *Studi sull'eleatismo* (Rome 1932) and van der Waerden's 'Zeno und die Grundlagenkrise der griechischen Mathematik' (*Math. Annalen* 107, 1941, 144ff.), which offer detailed and, between them, convincing arguments against the view which, since Tannery, has been so widely accepted that it has been taken for granted even by scholars as critical as Cherniss (*Aristotle's Criticism of Presocratic Philosophy*, Baltimore 1935, p. 43n.165 and p. 387). The most that can be said for Raven on this subject is that he recognizes more clearly than many of his mentors that "the target at which the dilemmas (of) Zeno's were aimed was very much wider than merely the Pythagoreans" (p. 71). Still, he thinks there "is little doubt that, at least in the arguments against plurality" (p. 75), Zeno is attacking a view which construed bodies as aggregates of spatially extended point-atoms; and since Raven thinks Pythagorean "number-atomism" represents just this view, he holds that Zeno's arguments against plurality find their "most real validity" (pp. 72–73) as anti-Pythagorean polemic.

But what is the evidence that Pythagorean contemporaries of Zeno believed in "number-atomism" at all?

The only answer I can find in Tannery and his many followers is the definition of the point as *monas thesin echousa*, whence, Tannery concludes, "il suit immédiatement . . . que le corps géométrique est une pluralité, somme des points" (*Pour l'histoire de la science hellène*, Paris 1887, p. 250). But on the several occasions when Aristotle cites or alludes to this definition, he never once presents it as peculiarly Pythagorean doctrine;² [31] he treats it as a generally accepted and unobjectionable definition. The *monas* of this definition Aristotle does not take as a spatially extended unit, since at *De anima* 409a5 he presents lines not as aggregates, but fluxions (*kinēseis*) of points. For the ascription of the definition to the Pythagoreans, one must go to Proclus (*In Eucl.*, p. 95, 20 Friedl.), which is utterly inconclusive for the point at issue here, since (1) Pythagoreans would certainly employ a definition {169} common to the mathematicians of their time without necessarily committing themselves to the notion of *extended* points, and (2) Proclus does not associate with this Pythagorean view the belief that the point was extended but interprets (96, 3) their view of number in terms of *monadikos arithmos* (i.e., not possessing spatial extension; see Arist. *Met.* 1080b18, 1092b20–22) and associates (99, 18) the Pythagorean view with the generation of extended lines by fluxion (*kinēsin hupostasas*), not by summation, of points. If we pass from these secondary sources to Zeno's own fragments, we shall not only find nothing which names or specifically implies number-atomism as the butt of his arguments against plurality, but indeed a positive reason (not noticed in the modern literature, to my knowledge) which makes it unlikely that number-atomism *could* have been the view he is here combating. Before presenting the two dilemmas of B1 and B3, Zeno demonstrates at B2 that whatever exists must have magnitude. Why should he be taking the trouble to *prove* this by

The formal definition cited by Tannery is at *De anima* 409a6. Heath (*History of Greek Mathematics*, Oxford, 1921, I, 69) cited also *Met.* 1084b25. O. Becker ("Die Lehre vom Geraden und Ungeraden im neunten Buch der Euklidischen Elemente" *Quellen und Studien zur Geschichte der Mathematik* 3, 1936, Abt. B 537) documents the statement "die bei Aristoteles, da wo er von der Pythagoreen spricht, häufige Wendung $\sigma\tau\iota\gamma\mu\eta\ \tau\omicron\tau\tau\iota\ \mu\omicron\nu\alpha\varsigma\ \theta\epsilon\sigma\iota\varsigma\ \epsilon\chi\omicron\upsilon\sigma\alpha\iota$, $\mu\omicron\nu\alpha\varsigma\ \sigma\tau\iota\gamma\mu\eta\ \epsilon\chi\omicron\upsilon\sigma\tau\omicron\varsigma$ " with the note "Vgl. beispielsweise *Met.* 1016b25–26, 29–31." Burnet (*Early Greek Philosophy* 4, London 1945, 290n 2) refers to *Phys.* 227a27 "for the identification of the point with the unit." Of these Aristotelian passages, the first is "concerned with Xenocrates' definition of the soul" (Cherniss, *Aristotle's Criticism of Presocratic Philosophy* 389), the second with Zeno's doctrine (see Ross *Aristotle's Metaphysics* [p. 181, above] ad 1084a25), the third states Aristotle's own doctrine while the fourth runs "if, as some say, point and unit have an independent existence, without identifying the 'some', there is no mention of Pythagoreans in any of them." Burnet (*Early Greek Philosophy*, 291n 3) takes out the argument by saying that "Zeno in his 10th argument about motion . . . used *onkos* for points. But, of course, *onkos* here did not mean 'points' but 'masses' or 'bodies' (Ross ad *Phys.* 250b33); in Eudemos' paraphrase of this argument, they are called 'cubes' (Simpl. *Phys.* 1016, 9ff.)

formal argument, if it formed the implicit assumption of the position he is trying to disprove? Clearly Zeno is anticipating an avenue of escape from the dilemma he is to propound at B1; this avenue no number-atomist could think of taking, for it would be closed to him by his own theory.³

Raven goes one better the view that number-atomism was held by the Pythagoreans in Zeno's time. He projects it into the earliest phase of Pythagorean thought. But this goes against the only statement in the doxographers which categorically ascribes belief in corporeal units to any Pythagorean: "Ecphantus of Syracuse, one of the Pythagoreans, (taught that the *archai*) of all things are the indivisible bodies and the void; for he was the first to declare that the Pythagorean units are corporeal" (DK 51, 2; Aët. 1, 3, 19). Whatever may be the date of Ecphantus,⁴ this statement definitely implies that number-atomism was *not* regarded by the tradition stemming from Theophrastus as an original feature of Pythagoreanism. Just why Raven should dismiss this statement in Aëtius as "merely tantalizing" (p. 68). I do not know. In Aristotle there is not a single word to lend color to the view that number-atomism figures in primitive Pythagoreanism: none at 986b22, and none at 985b23ff. which, as I have argued against Raven, cannot be taken as a description of Pythagorean views later than those of the [32] 'others' at 986a22ff. The other Aristotelian testimonies discussed by Raven at pp. 52ff. are worthless as evidence for early Pythagoreanism, since there is no hint of chronology in any of them. So the ascription of number-atomism to early Pythagoreanism is pure conjecture, unsupported by positive evidence and damaged by the contrary evidence of Aëtius about the innovation of Ecphantus. Moreover, it is an intrinsically implausible conjecture, for number-atomism {170} is wholly inapplicable to the explanation of those very things which, we may reasonably assume, were the prize specimens of the earliest phase of the theory that "things are numbers," viz. musical harmony, justice, soul, *kairos*, and the like. Our best clue to the whole meaning of the theory that "things are num-

³ {And note that Zeno assumes in B1 that if an extended magnitude is divisible at all, it is divisible without limit. Had he been arguing against an atomist, he would have been likely to make more of this, since it would have formed the very crux of the dispute }

⁴ The content of the views ascribed by the doxographers (DK 51, 1-5) to Ecphantus shows that he was, at most, no earlier than the atomists and, more probably, a fourth-century figure. I can attach no credence to Tannery's hypothesis that "Ecphante n'a été qu'un prêtre-nom pour Héraclide (Ponticus), de même que Timée pour Platon" (AGP 11, 1898, 266), which has been widely followed (e.g., Heidel, ("The ἀνταρτοι ὄντοι of Heraclides and Asclepiades.") TAPA 40 [1909], (5-21, at p. 6; Heath, *Aristarchus of Samos*, Oxford 1913, 251ff.). If, as is generally conceded, the source of the doxographic reports on Ecphantus is Theophrastus, it seems most unlikely that Theophrastus would present the view of a fictitious character in a dialogue of his own contemporary, Heraclides, in such a form that would lead the doxographers to mistake these views for those of a historical thinker. There is no parallel for such a mistake in the doxographic tradition, the case of Timaeus is surely evidence to the contrary. The alleged fictitiousness of Hicetas lends no support to Tannery's view about Ecphantus, since it is open to exactly the same objection.

bers" is surely the Pythagorean discovery of the numerical formulae for the concordant intervals in music which must have been the scientific source of the whole theory. Here there could be no question of number-atomism. Thus the 1/2 ratio for the octave could only mean that the numbers 1, 2 would be assigned to *any* pair of homogeneous strings the first of which was half the length of the second (cf. van der Waerden, "Die Harmonielehre der Pythagoreer," *Hermes* 78, 1943, 163ff.). It would be absurd to suggest that the numbers 1, 2 could be considered by any mind, no matter how bemused by numerology, the numbers of the "spatially extended units" composing the strings of their sounds. Nor could there be any question of number-atomism in the extensions of this theory to medical, moral, or psychological concepts. Is there then any reason to assume that the concurrent cosmological generalization of the theory (καὶ τὸν ὅλον οὐρανὸν ἁρμονίαν εἶναι καὶ ἀριθμὸν, 986a3) would follow a pattern which is so alien to its musical base and all its other generalizations?

Raven holds that the Pythagoreans from the earliest period used number also in a very different way, as the *logos mixeōs*, explaining the sensible properties of things by way of the numerical proportions of the opposite elements in their constitution. The ascription of this view to early Pythagoreanism is also pure conjecture, since the only testimony on which it rests (*Met.* 1092b14ff.) is chronologically indeterminate.

If we grant—as I think we should, in spite of Cherniss's objection in his review of this book, cited above—that in this passage Aristotle is discussing a Pythagorean view (see Ross *ad* 1092b8–1093b29), we are still none the wiser as to the date of its origin. That Aristotle should refer to the formula for "flesh or bone" to illustrate the theory suggests an Empedoclean origin. But this is far from conclusive, since (1) Aristotle is talking rather carelessly here (we could hardly suppose that the 2/3 ratio would be the formula of *both* "flesh and bone") and (2) the Empedoclean theory of a numerical *logos mixeōs* might itself have historical antecedents. Have we any reason for projecting these into earlier Pythagoreanism? The reason offered by Raven—that without some such theory the early Pythagoreans would have given "no account of what was to all other early Greeks a matter of the first concern, the nature of the material of which things consisted" {171} (p. 61)—does not take us very far. There is another reason, conjectural, to be sure, but at least suggestive, which he might have considered: It is well known that the general norm of *krasis* in Greek cosmology and medicine was *isonomia* (Alcmaeon B4) or *isomoiria* (*On Airs* 12), i.e., the 1/1 ratio; I believe that this idea [33] is very early, figuring already in Anaximander ("Equality and Justice in Early Greek Cosmology") CP 42, 1947, 168ff. (**1.74ff.). Over against this widespread view the Pythagorean discovery of the formulae for musical harmony introduced an entirely new idea, for it depicted patterns of good *krasis* which did *not* conform to *isonomia* but involved pairs of unequal (and, in each case,

odd-even) numbers: $1/2$, $2/3$, $3/4$. This new idea might well have led the Pythagoreans to look for ratios of the same type in phenomena other than music; it would thus lay the foundation for a doctrine of numerical *logos mixeōs* in natural inquiry well in advance of Empedocles and inspired by motives quite different from his. It may be significant in this connection that the $2/3$ ratio in Aristotle's example is definitely non-Empedoclean, while it does express one of the major formulae of musical harmony recognized by the Pythagoreans.

I regret that the limits of this review preclude so much as a notice of a great variety of other interesting points raised by this book. Though I think Raven is quite mistaken in believing that he has established "a complete and coherent picture of the evolution of the Pythagorean system during the fifth century" (p. 163), he does make good a number of subsidiary points of considerable intrinsic importance, of which I can only mention two: First, his contention that "there was in earliest Pythagoreanism an eternal dualism" (p. 18). Second, his vindication of the authenticity of Melissus' denial of the corporeality of Being at B9. The first is argued convincingly against Cornford's view that original Pythagoreanism was a monistic system. The second is maintained against a view widely held by modern scholars, and though it is only incidental to Raven's main thesis it concerns a matter of exceptional historical interest. I shall, therefore, summarize Raven's argument and carry it one step further:

Since the fifth edition of Zeller's great work (below, n.6), the plain words of Melissus at B9, *ἐν δ' ἐὼν δεῖ αὐτὸ σῶμα μὴ ἔχειν. εἰ δὲ ἔχοι πάχος, ἔχοι ἂν μόρια, καὶ οὐκέτι ἐν εἴη*, have generally explained away as a contrary-to-fact hypothesis, whose conclusion Melissus would apply to his opponents but would repudiate for himself. But, as Raven argues, and as H. Gomperz had argued before him in a valuable paper apparently unknown to Raven ("Asōmatos," *Hermes* 67, 1932, 155ff.), {172} the premise of the argument "Being is One" is indisputably Melissean doctrine; therefore its two consequences, "Being has no *sōma*," and "Being has no *pachos*," must be true for Melissus himself. There is no escape from this conclusion, except on the assumption that Melissus' argument is deliberately sophistical, a hypothesis so improbable that no one has dared to sponsor it. At this point, however, we are faced with the retort: How can Melissus' Being be "infinite in magnitude" (B3) if it is incorporeal and has no *pachos* at all? This is a strong objection, and no answer has yet been offered, except by Gomperz, and this is wholly unsatisfactory. Gomperz argued ("Asōmatos," 158ff.) that pre-Socratic thought merged the ideas of infinity and incorporeality. But his evidence is not convincing. The *Apeiron* of Anaximander and the infinite air of Anaximenes and Diogenes are surely *not* conceived as "incorporeal," since they are presented as the stuff from which all corporeal things arise by a physical process of segregation or condensation. (And cf. Diogenes B7, ἀθάνατον

καὶ αἰδῖον σῶμα). Nor can we say that Anaxagoras thought of his infinite *Nous* as incorporeal. His *Nous* was *leptotaton pantōn chrēmātōn*, and even the "finest," subtlest, most volatile thing is still body. (DK, "Wort-Index" s.v. λεπτός, λεπτομερής). Aristotle's statement that fire, being *leptomerestaton* is μάλιστα τῶν στοιχείων ἀσώματον (*De anima* 405a6-7) is worthless as evidence to the contrary, since it is offered as a description of the Soul in both Democritus (8ff.) and Heraclitus (25ff.). How then could Melissus affirm that Being is incorporeal while infinite in magnitude? Because, I suggest, the infinity in question is that of beginningless and endless duration, not that of unlimited spatial extension. The former *could* [34] be asserted by Melissus of incorporeal being, while the latter obviously could not. For the truth of the former, I would point to the fact that in each of the fragments on which Melissus argues for the infinity of Being the sense is clearly the exclusion of temporal limit: οὐκ ἐγένετο . . . , ἀλλ' ἀπειρόν ἐστιν, B2, ἐστιν αἰεί, hence τὸ μέγεθος ἀπειρον αἰεὶ χρη εἶναι, B3; whatever has *archē* and *telos* (for the temporal sense of these words, see B2) could not be *aidion* and *apeiron*, B4; if there were many beings, succeeding each other in time, each would limit the other, B5, (with Eudemus' paraphrase); and that *apeiron* at B6 must have the same sense is suggested by Simplicius' immediate reference to Parmenides' *oulon* . . . *agenēton*.⁵ Herewith the alleged corporeality of Melissean Being is laid to rest in the grave which contains Burnet's famous dogma of Eleatic "materialism." {6} Why, after assisting in this funeral, Raven

⁵ Three objections may be raised on the strength of (1) Arist., *Met.* 986b19, Μέλισσος δὲ (ἔοικε) τοῦ κατὰ τὴν ὕλην (ἐνὸς ἀπερσθαι). (2) Arist. *De gen. et cor.* 325a14, ἀπειρον (τὸ ὄν) . . . τὸ γὰρ πέρας περαίνειν ἂν πρὸς τὸ κενόν. (3) Melissus B 7 (10), ἀνάγκη τοίνυν τιν εἶναι, εἰ κενὸν μὴ ἐστιν. I reply: both (2) and (3) are dialectical (though certainly not sophistical) arguments against current belief. Because "void is nothing," whatever exists can have no *peras* (2), and must be a *plenum* (3). To argue in this fashion does commit Melissus to the positive assertion that his Being is a corporeal infinite and a corporeal *plenum*. As for (1), it is plainly no paraphrase of Melissus but an Aristotelian argument, believing, as he does, that only the material is infinite, Aristotle infers, "it seems . . . that Melissus (whose unity was infinite) treated the material unity." No one familiar with Aristotle's stronghanded methods of foisting his own categories on the thought of his predecessors will be tempted to attach the slightest historical value to this imputation of Melissean materialism, or to his other statements that both Melissus and Parmenides (1) believed that only sensible things had being (DK 28A24-25), cf. Cherniss, *Aristotle's Criticism of Presocratic Philosophy*, 23n 85.

⁶ [My confidence in this interpretation does not seem to have commended it to others. It has been firmly rejected by several scholars (see especially W. K. C. Guthrie, *A History of Greek Philosophy*, Vol. 2 [Cambridge, 1965], pp. 110-13 and D. J. Furley, *Two Studies in the Greek Atomists* [Princeton 1967], pp. 58-61). I hope to have some future opportunity to review their arguments and explain why I am still of the same opinion. Here I may comment briefly on the two best arguments that have been offered and add a third remark on the sense of *pachos* at B9. (1) As Zeller pointed out long ago (*A History of Greek Philosophy*, I, tr. S. F. Alleyne [London 1881], pp. 630-23), the paralogism with which Aristotle charges Melissus in *De soph. el.* 167b13ff., 168b35ff., *Phys.* 186a10ff. reveals Aristotle's conviction that Melissus ascribed spatial infinity to Being. This is indeed a substantial argument; but Aristotle's frailties as an exegete are well

should say, "It [Melissus' Being] was not even incorporeal, simply and solely because the thought that it could be so never entered the Eleatics' minds" (p. 91), I am unable to understand.

known, and in this case it is fairly clear that his exegesis rests on no privileged data: a comparison of the wording of his fullest exposition of it (the first of the three passages to which I have just referred) with B2 will show that Aristotle is basing his interpretation on data fully available to us, so that we are in as good a position to judge as was he. The data show that there is absolutely *no mention* of spatial infinity whatever, no *textual* indication that *apeiron* refers to anything but the temporal infinity which is entailed by the premise that generation has no other beginning nor conclusion, and hence no unambiguous textual basis for Aristotle's charge that Melissus inferred "has no [spatial] *archē*" from "is ungenerated" (It may be worth noticing in this connection that Eudemus *apud* Simplicius, in *Phys.* 110, 6ff. does not invoke the spatial interpretation *per se* *pro alio* but is content to operate exclusively with the temporal interpretation in glossing B5.) (2) It has been argued that in B3, οὕτω καὶ τὸ μέγεθος ἀτελεῖον ἀεὶ ἔχει εἶναι, implies a reference to spatial infinity. Now it is perfectly true that Aristotle would not have used *megethos apeiron* to refer to something whose infinity extends in time but not in space. But it has yet to be proved that Melissus could not have done so either. In all of the allusions to this point, from Zeller down, it is simply assumed that *megethos* in the phrase *to megethos apeiron* could refer to nothing but spatial magnitude. I am at a loss to account for the assumption, since it would be good Greek to speak of something which has unlimited *mēkos* of any sort as being *to megethos apeiron*, and temporal stretch would be thought of as having length fully as much as would spatial distance: *mēkos chronou* would be as natural an expression as *mēkos hodos* and the like. Finally (3), we must not lose sight of the fact that in Zeno B1 the divisibility of the existent follows *exclusively* from the premise that it has extensive magnitude in three dimensions; so the phrase ἀνάγκη ἔλαστον μέγεθος εἶναι ἔχει καὶ πάχος in the premise must refer definitely and specifically to just this property of the existent: this is the only consideration that propels the reasoning. Is it then very likely that Melissus should have used *pachos* in a radically different sense in a parallel context—a sense so different that an existent could have three-dimensional extension but no *pachos*, as supposed by Guthrie (*History*, p. 112) and Furley (*Two Studies*, p. 61)? But even if we were to waive this linguistic point, the comparison with the Zenonian fragment would suffice to show that for Eleatic the possession of spatial extension would of itself entail infinite divisibility. How then could Melissus have supposed that his Being was both spatially extended and indivisible? Furley speculates that (a) "its incorporeality allowed no internal distinctions to be made" and (b) "its infinity offered no starting point for a division" (ibid.). These are ingenious suggestions. But if considerations of this order were material to the reasoning, and so vital as to allow Melissus to conjoin three-dimensionality with indivisibility while it entailed divisibility for Zeno, would there not have been some allusions, however slight, to one or another of them in the fragment?

ZENO'S RACE COURSE

WITH AN APPENDIX ON THE ACHILLES

THE FIRST [of Zeno's arguments against motion which "give trouble to those who try to refute them"] says that there is no motion, because the moving [body] must reach the midpoint before the goal. . . . (Aristotle, *Phys.* 239b11–13)^{1,2}

In the same way one should reply to those who pose Zeno's argument, [claiming] that it is always necessary to traverse the half, and these [halves] are infinite (i.e., infinitely numerous), while it is impossible to traverse infinities, (ibid., 263a4–6)

For there are many arguments contrary to common opinion, such as Zeno's that it is impossible to move or to traverse the race course. . . . (Aristotle, *Top.* 160b7–9)

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¹ Those who may know the account of this paradox and of the Achilles paradox in the chapter on Zeno contributed to *Philosophic Classics*, ed. W. Kaufmann (Englewood Cliffs, N.J., 1961), pp. 27ff., at 35–40, might note that the present paper is meant to supersede it completely. That chapter was prepared on short notice to meet an urgent pedagogical need and, as I explained at the time (p. 27n.1), drew on "purely provisional results of work-in-progress." I am now presenting the results of a later study (1963–64) made possible by a grant from the National Science Foundation, which I hereby acknowledge with thanks. I must also thank those who have read and criticized a draft of this paper. In addition to the specific acknowledgments I shall be making below, I wish to mention my debt to Professor A. Grünbaum, whose comments enabled me to remove several false or misleading statements, as well as to Professors J. A. Benardete and R. Sorabji for similar help. (The reprint contains some further corrections, one of which was prompted by a valuable criticism made by Professor R. B. de Sousa.)

² Aristotle goes on to refer to the next paradox by title ("the one which is called 'the Achilles'"). But he cites no title for the present one, referring to it by a phrase (*τὸ διχοτόμου*: an infinitive, 239b18–19) he would scarcely have used if a title (grammatical noun) had been available to him. That this argument should have been called "the Dichotomy" (as frequently in the modern literature) is unlikely. dichotomic sequences occur in several surviving Zenonian arguments (frag. 1, frag. 2, cf. also the Eleatic argument which may be derived from Zeno in Aristotle *De gen. et cor.* 316a14ff. and 325a8–12 and Porphyry *apud* Simplicius, *Phys.* 140, 1–5). In calling it "the Race Course" (on the strength of Aristotle, *Top.* 160b8–9, "Zeno's [argument] that it is impossible to move or to traverse the race course"), I am not implying that it was so called in antiquity. References to Zeno's fragments are to DK⁶ (Berlin: 1952).

Starting at S, the runner cannot reach the goal, G, except by traversing each of the "halves," i.e., subintervals of SG, each of them $SG/2^n$. Did the argument order these as a progression ($n = 1, 2, 3 \dots$) or as a regression ($n = \dots 3, 2, 1$)? The latter was the popular version of the argument in antiquity,³ and the Aristotelian commentators assumed this had been the form of the Zenonian original.⁴ Most modern scholars⁵ have thought so too. But the regressive construction [95] is hard to square with Aristotle's remark that "the argument assumes falsely that it is impossible to traverse, or come in contact with, each one of an infinite number of things in a finite time" (*Phys.* 233a21–23). In a regression the obvious conclusion would be that the runner could not even get started.⁶ In that case Aristotle's reference to the impossibility of doing the job "in a finite time" would have been pointless: if the runner cannot start, even infinite time would not have enabled him to finish. Conversely, Aristotle's remark is perfectly intelligible on the assumption that the text he had read depicted a progression.⁷ A third possibility is unlikely: the layout of the original argument (as vs. later, compressed, accounts of it,

³ Cf. Sextus, *Pyrrh. hyp.* 3.76 and *Adv. math.* 10.139–41, where it is used by Sextus himself against the Stoics without allusion to its Zenonian authorship.

⁴ See items 20 (Simplicius) and 21 (Philoponus) in H.D.P. Lee, *Zeno of Elea* (Cambridge: 1936). But since they do not seem to have known the Zenonian original—their accounts of the paradox seem completely dependent on Aristotle—this has no probative value for the question at issue here. All it tells us is that this is the way they read the Aristotelian accounts (which are ambiguous on this point), and their reading of Aristotle is far from infallible.

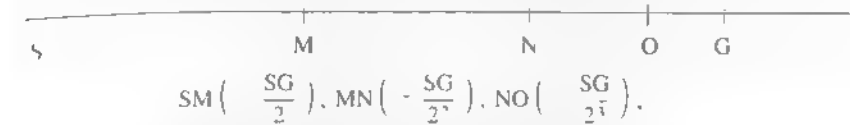
⁵ E.g., E. Zeller, *Die Philosophie der Griechen* (7th ed.; Leipzig, 1923), I, 756; J. Burnet, *Early Greek Philosophy* (4th ed.; London, 1930), p. 318. (Burnet even imports this into his paraphrase of the Aristotelian text). W. D. Ross, *Aristotle's Physics* (Oxford, 1936), pp. 72 and 658–59, and G.E.L. Owen, "Zeno and the Mathematicians," *Proc. Arist. Society*, 58 (1957–58), 199–222, at p. 207.

⁶ For Zeno would have been able to count on the enormously plausible premise that the runner could not make a number of contiguous runs unless he started off with a first run (cf. n. 27 below); on the regressive construction there can be no first run.

⁷ The reference to time would still be compatible with a regressive construction if the reasoning had been as follows: (i) suppose the runner has reached G; if so, then (ii) he must have had to traverse an infinite number of sub-intervals, which (iii) he could not have done in a finite time. Cf. Simplicius, *Phys.* 1289, 6–13: "If there is motion, there will be something which *has traversed* an infinite number [of sub-intervals] in a finite time. . . . Hence that which *has moved* over a finite interval *will have traversed* an infinity. . . ." I have italicized the use of the perfect and future perfect required by this construction of the reasoning which, given (i), throws all of the necessary, though impossible, antecedent traversals of sub-intervals into the past. Compare the tense of corresponding verbs in the Aristotelian reports (cf. the citations above) "must reach [not "must have reached"] the midpoint . . ."; "always necessary to traverse [not "to have traversed"] the half . . ."; "impossible to move or to traverse [not "to have moved, traversed"] . . ." It seems clear that Aristotle is not envisaging an argument premised on (i). Another objection to that construction is Aristotle's remark that in the Achilles "the reasoning is the same as in the Dichotomy [= the Race Course], though it differs in not dividing into half the distance still to be added" (*Phys.* 239b18–20): it is obvious that the Achilles could only be construed as a progression

which presupposed the reader's familiarity with its form) could scarcely have left the reader in doubt on so conspicuous a feature of its logical machinery.

We may assume then that Zeno laid out the following sequence:



Let us speak of this as "the Z-sequence" (or, when summing it, as "the Z-series"); of the "halves" that make it up as "the Z-intervals"; of running through any of them as "making a Z-run."

The argument then as reported by Aristotle in the first two citations above boils down to:

- (1) To reach G the runner must traverse the Z-sequence (or, make all the Z-runs).
- (2) It is impossible to traverse infinitely many intervals (or, make infinitely many Z-runs). Therefore
- (3) The runner cannot reach G.

Aristotle's analysis of the reasoning (*Phys.* 233a21–31) is as follows: Zeno's assumption that the Z-sequence could not be traversed in a finite time was due to an oversight: he overlooked the fact that the time of the run is infinitely divisible; [96] otherwise he would have realized that a finite time, similarly divided as a dichotomic progression, would yield a sequence of temporal subintervals matching the Z-sequence member for member, giving the runner just the right amount of time he needs to run each Z-interval as he comes to it. But what is the evidence that Zeno did make this mistake? Aristotle's own certainty on this point (expressed here and reiterated in 263a11–21) is most impressive (cf. Ross, *Aristotle's Physics*, p. 73), until one takes three things into account:

- (a) Aristotle never says, or implies, that there is any direct evidence of the mistake in Zeno's text. He never even tells us that Zeno *said* (or claimed, maintained, etc.) that it is impossible to traverse the Z-sequence "in a finite time," but only that "the argument falsely assumes" this.⁸ Still less does Aristotle say, or imply, that Zeno *said* (or claimed, maintained, etc.) that time and space were disparate with respect to infinite divisibility.

⁸ This is (inadvertently) obscured in the standard English translations, as, e.g., the Oxford translation of the *Physics*, which renders 233a21–22 by "Zeno's argument makes a false assumption in asserting that . . ." The italicized words correspond to nothing in the Greek text. For similar mistranslation see the one in the Loeb Classical Library (1934) and Lee, *Zeno of Elea*, p. 43. For the correct translation, see e.g., H. Carteron in the Guillaume Budé translation of the *Physics* (Paris: 1931).

(b) Aristotle's claim that Zeno made the mistake is not disinterested: if Zeno had *not* made it, Aristotle's refutation of the puzzle would have scored its bull's eye on the wrong target.

(c) There is definite, if indirect, evidence to the contrary in the Achilles: there the generating ratio of the Z-sequences (two of them in that puzzle) is not fixed arbitrarily, as in the Race Course (where no reason is given why SG should be divided into "halves" as against thirds, fifths, etc.), but is determined by the ratio of the speeds of the two runners. Since Zeno could not have ignored the elementary fact that speed is the time-rate of the change of distance, he must have believed that the time would decrease as unendingly as would the distance: otherwise the generating ratio of the spatial divisions would not remain constant and the Z-sequences would break down.

If we reject Aristotle's analysis of Zeno's error in this puzzle, we have two principal alternatives to choose from:

(I) Zeno might have thought that the Z-intervals, *being infinitely numerous, would have an infinite sum* and could not be traversed in a finite time for just that reason. This is a perfectly credible possibility. Zeno made the same mistake in frag. 1.⁹ Having made it once, he might very well have made it here again. However, if this had been his route to the conclusion, it would have added a substantial stage to the argument as reported by Aristotle and analyzed above in (1) to (3): the inference from the infinite divisibility of SG to its infinite length. It would be difficult (though, of course, not impossible) to believe that Zeno could have made this inference without saying so (and as emphatically as he did in frag. 1) and that, if he had said so, no trace of this should have survived in Aristotle's summary, where the impossibility of reaching G is inferred directly from the impossibility of traversing "infinities" (*apetra*)—an expression which [97] obviously has in view the infinitely many "halves" themselves, not their infinitely large sum.

(II) Construing the traversal of a Z-interval as a discrete physical act, and hence thinking of the traversal of the whole of the Z-sequence as entailing *the completion of an infinite sequence of acts*, Zeno might have assumed that reaching G *would involve a logical contradiction*: that of reaching "the end of something that has no end," as the point is put by Ross.¹⁰ He could have thought that these assumptions would be so intuitively obvious to his readers in the context of this argument that they called for no proof, nor even for explicit formulation. This would account for his failure to spell them out, thus leaving his text defenseless against Aristotle's

⁹ See my analysis of the reasoning in this fragment in pp. 31–34 of the work cited in n. 1 above (and my article "Zeno of Elea" in the *Encyclopedia of Philosophy* (New York: 1967) (*1.241ff.)).

¹⁰ Aristotle's *Physics*, p. 74, in the course of explaining "the real underlying difficulty" raised by Zeno's puzzle. Cf. Renouvier's interpretation of the Achilles, *Trat  de logique formelle* (new ed.: Paris, 1912), pp. 46–49, followed by V. Brochard, *Etudes de philosophie ancienne et moderne* (Paris, 1912), pp. 9–10, who in turn is followed by T. L. Heath, *A History of Greek Mathematics* (Oxford, 1921), I, 279, and Frankel pp. 2–4.

alternative interpretation of it. All this is, of course, speculative. Even so this possibility, all things considered, fits best the available evidence: somewhat better than does (I), and distinctly better than the one of which Aristotle was so sure. It is in any case the most interesting one philosophically and well deserving of serious discussion on that account.

II

The claim that the *completion of an infinite sequence of discrete acts* ("C" for short) is a self-contradictory notion, is far from being obviously false. Distinguished modern thinkers have argued that it is true.¹¹ Have they made their case? An easy way to make it would be to define C as "making all the acts in the sequence, *including the last*." This seems to be, in effect, what Ross did above, since he took "reaching the end" to be in obvious contradiction with the fact that the sequence "has no end" (which, in this context, could only mean "has no last member"). If this definition were mandatory then, of course, a completed infinite sequence (which, in the case of progressions of the ordinal type of the Z-sequence, can have no last member) would be as flat a contradiction as a round square. But C can be defined, alternatively, as "reaching the point of having no more of those acts to make, having skipped none along the way."¹² Hence to settle the issue by recourse to the first definition would be to beg the question. Nor, again, would it do to argue that the sequence is uncompletable because, *no matter how many acts* had been made, more of them would still remain to be [98] made (Black, *Problems of Analysis*, 101). This too would beg the question, unless the italicized phrase were corrected to "no matter how large a *finite* number of acts,"¹³ in which case we would get only the tautology that the infinite sequence could not be completed by a finite number of acts.

A line of argument that could be kept free of both of these mistakes tried to

¹¹ The most vigorous statement of this position is in Black's "Achilles and the Tortoise," *Analysis*, XI (1951), 91–101 (reprinted in M. Black, *Problems of Analysis* [Ithaca, 1954], pp. 95ff. Citations here are to the reprinted edition). Though Black subsequently (pp. 109ff.) renounced this position, his original argument remains a major contribution to the topic. For a subsequent (and somewhat more guarded) defense of that position, see I. Thomson, "Tasks and Super-tasks," *Analysis*, 15 (1954), 1–13. Cf. also the earlier remarks in H. Weyl, *Philosophy of Mathematics and Natural Science* (Princeton, 1949), I, 42: he too apparently thought that the completion of an infinite sequence of discrete acts would be a logical impossibility, but his reasons are obscure.

¹² J. Watling, "The Sum of an Infinite Series," *Analysis* 13 (1953), 39ff., following R. Taylor, "Mr. Black on Temporal Paradoxes," *Analysis* 12 (1952), 38ff.; see also Owen, "Zeno and the Mathematicians," p. 205.

¹³ Cf. Watling, "The Sum of an Infinite Series," p. 40.

prove *C* by establishing that logical contradiction would result if the completion of an infinite sequence of acts were followed by a determinate state.¹⁴ Thus Black argued: Suppose that a machine, Beta, had transferred a marble from left to right an infinite number of times within a finite time-interval. Where would the marble be when Beta finished? "If it ought to be found on the right, then by the same reasoning it ought to be on the left. But it cannot be both on the right and on the left" (p. 105). This, Black thought, proved that a contradiction is entailed by the hypothesis that Beta had finished its infinity-run. But (to adapt Benacerraf's criticism of a precisely similar argument by Thomson)¹⁵ all we would be entitled to infer from Black's premises is that the marble could be *either* on the right *or* on the left: either result would be consistent with the premises, and the supposed contradiction does not come off.

Yet neither does this mean that the line of investigation opened up by Black has come to nought. There is a fairly simple way of deriving a contradiction from the hypothesis that Beta has moved the marble infinitely many times from left to right in a finite time-interval (and has survived to repeat the feat thereafter): Let us begin by noting that Beta, when in good running order, satisfies the following description:

(D,1) It is a *finite* state system, for at every instant of its history it is in one or the other of two non-instantaneous states— S_L , when the marble is left of center, and S_R , when this is right of center.

(D,2) It is a *discrete* state system:¹⁶ the occurrence of each state is immediately preceded and immediately followed by a unique occurrence of the other.¹⁷

Let us then make the following hypothesis, and consider the consequences:

(H) In the minute between 10:00 and 10:01, Beta has gone through an infinite succession of states, timed on the usual dichotomic progression: S_L during the first 1/2 minute, S_R during the next 1/4 minute, S_L again during the next eighth of a minute, and so forth. Beta has survived in good running order.

It follows from (D,1) that {during an interval, t , starting} at 10:01 Beta will be in one of the two states. {Let this be S_L . It follows from (D,2) that the S_L state at t has an immediate predecessor in the S_R state. But it follows from (H) that the S_L state at t can have no immediate predecessor,} since every occurrence of S_L prior to t was separated from t by infinitely many occurrences of S_L and S_R .¹⁸

¹⁴ Cf. Black, *Problems of Analysis*, pp. 104–5 and 111, Thomson (above, n.11), pp. 5ff.

¹⁵ "Tasks, Super-Tasks, and the Modern Eleatics," *Journal of Philosophy* 59 (1962), 768ff.

¹⁶ For the term "finite discrete state system," see, e.g., N. Rescher, "Discrete State Systems, Markov Chains, and Problems in the Theory of Scientific Explanation and Prediction," *Philosophy of Science* 30 (1963), 325ff.

Thus the first native postulates of a discrete series are satisfied. See e.g. L. V. Huntington, *The Continuum and Other Types of Serial Order* (2nd ed.; Cambridge, Mass., 1917), p. 19.

¹⁷ To my colleagues, C. G. Hempel and Paul Benacerraf, I am indebted for suggestions which

The same contradiction can be proved for those infinity-machines in recent discussions which are finite discrete state systems and are not flawed by some extraneous logical blemish: e.g., Black's Gamma, Delta, and Epsilon;¹⁹ Thomson's lamp and parity-machine,²⁰ Benardete's apple, placed on the table, withdrawn, replaced, etc. infinitely often.²¹ All these are two-state systems, and the extension of the reasoning to each of them should be obvious. But the argument can be generalized to cover systems with any finite number of discrete states.²² A good example would be an imaginary computer limited to a finite number, n , of states sufficing to compute every digit in the decimal expansion of π , displaying (e.g., on a dial) at any given instant just one of the ten numerals (0, 1, . . . 9), the one computed in the immediately preceding state. Suppose it were programmed to compute the first digit of π in the first 1/2 minute after 10:00, the second digit in the next half-minute, and so on, every digit in the whole expansion thus passing through its dial in the course of the minute, the machine surviving the ordeal in good order. It would follow from the description that at 10:01 the computer would display a particular numeral and that there occurred an immediately preceding state in which just this numeral was computed. But it would follow from the hypothesis that this could not have occurred, since every computation of that numeral prior to 10:01 was followed by infinitely many computations of other numerals.²³

But what precisely does this argument prove? Does it establish the claim, *C*, with which we started in this section? It should be obvious that it does not. The contradiction is engendered not by the hypothesis that an infinity-run has

enabled me to improve earlier versions of this argument. To Benacerraf I am deeply indebted for many discussions of the philosophical implications of this argument and of Zeno's paradox which have clarified my thinking at crucial points and saved me from several mistakes. It should go without saying that neither he nor Hempel may be held responsible for residual blemishes in the argument or in the conclusions below.

¹⁹ Black, *Problems of Analysis*, pp. 102–7. His Alpha is unworkable (cf. Taylor, "Mr. Black on Temporal Paradoxes," p. 39). His Phi, whose shrinking marble will have disappeared when the infinity-run has been finished, will not satisfy (D,1).

Thomson (above, n.11), pp. 5–6.

J. A. Benardete, *Infinity* (Oxford, 1964), p. 23.

The contradiction will occur in any system that is at any instant in some particular non-instantaneous state having an immediate predecessor, be the latter a particular state of a member of a particular disjunction of states. A variation of the argument may be produced by ordering the infinity-run as a regression (in which case the contradiction will arise because of the failure of an immediate successor to the last state preceding the infinity-run) or, again, as a regression immediately followed by a progression (but not as a progression followed by a regression: this is precluded by [D,1] and [D,2].)

²³ The same conclusion would follow for the computer in Weyl (cf. n. 11 above), if it is a finite state system—which is not clear from his description. We may ignore the one mentioned by C. S. Chihara ("On the Possibility of Completing an Infinite Process," *PR* 74 (1965), 74–87 at) p. 80 when it has finished; we should be able to look at the tape to see what digit was printed last, as Chihara recognizes (in effect), the assumption that the whole infinite sequence of π could have been computed by a method which makes a last printing would be question-begging.

occurred but only by the hypothesis that this has occurred in a finite discrete state system. This is urgently relevant to the case which is of special interest in this paper: Zeno's runner. The argument would not apply to him at all unless his [100] progress toward G by way of all the Z-runs constituted just such a system. A moment's reflection will show that it does not. The state of being at G ("the G-state") does not bear the same relation to the state represented by the traversal of some Z-interval (some "Z-state") which any occurrence of S_L bears to some occurrence of S_R in the description of Black's Beta machine. In the latter case we can always count on an immediate predecessor for any of its given states. In the former we cannot: there are infinitely many Z-states between the G-state and any Z-state one cares to mention. Similarly: in Beta every state has an immediate predecessor; in the case of Zeno's runner the G-state would have none. This fatal disanalogy²⁴ shows at once where any attempt to negotiate on Zeno's behalf an analogue of the above argument would break down. To get around the difficulty, we would need some such first premise as

(Z1) At the terminal instant of any Z-run, the runner is at one of a finite set of points along SG (at M, or at N, or at O, . . .).²⁵

And this would be flagrantly false, since SG is a continuum of points and allows the runner a denumerable infinity of terminal points of Z-runs.²⁶

Denied this first premise, could we hope to recoup our loss by some other means? The best I can produce as *advocatus diaboli* is

[(Z2) If the runner is at any point, P , on SG at instant i , he must have made a run that began before i and terminated at P not later than i .²⁷]

²⁴ Which has escaped notice in the recent literature, where the infinity-machines used to illuminate Zeno's paradox have not been described as finite discrete state systems.

²⁵ Here and in the sequel, it is being assumed that a fantastically strong physical interpretation is available for a body's being precisely at a given point at a given instant. Should the reader object, he might be reminded that without such an assumption Zeno's puzzle loses all plausibility. To humor his claim that the sequence of Z-runs is infinite, we must allow that [e.g., a Z-run which brings the runner to a point, X , such that the length, XG , equals the diameter of an electron, does not bring the runner to G but, on the contrary, to a point which allows for infinitely many more Z-runs along XG .] (any point reached after traversing a finite number of Z-intervals would be physically distinguishable from the terminal point, G , as also from infinitely many intermediate points. A short way to refute Zeno would be to point out that the falsehood of his assumption vitiates the conclusion of his argument. I have foregone this line of refutation, and will do so again in the Achilles, so as to show that even if the positions of Zeno's mobiles could be fixed on their physical trajectories with a precision as absolute as that of geometrical points on a linear continuum, his arguments would still fail.)

²⁶ For analogous reasons the above argument would leave untouched infinity runs such as those assumed according to Black *Problems of Analysis* (p. 115) in the "traditional mathematical analysis" of the return to a state of rest in a finite time interval of an imperfectly elastic ball after infinitely many bounces of infinitely decreasing height. Such a mathematical model would not represent a finite discrete state system.

²⁷ An analogous assumption could be used with even greater intuitive force in a regressive

(Z2) Any point reached by the runner must have been reached by a unique run which reaches that point (i.e., which terminates at or beyond that point).

The attractiveness of (Z2) for Zeno's purpose should be evident on reflection: It is an ultra-plausible premise which can be shown to be inconsistent with the hypothesis

(Z3) The runner made all (and only) the Z-runs on a time-schedule such as that in (H) above.

For (Z3) entails that at 10:01 the runner could not be at any point short of G (for then he would not have made all the Z-runs by 10:01.)²⁸ And (as should be obvious) neither could he be beyond G. Hence (invoking an innocuous first premise in lieu of (Z1), *sc.* that at any instant the runner is at one, and only one, point on SG) at 10:01 he would be at G. Hence, given (Z2), there would have been a unique run, $R(G)$, which began before 10:01 and reached G not later than [101] 10:01. But it follows from (Z3) that there could be no such run as $R(G)$, since every run that begins in the preceding minute is a Z-run, and the terminal point of any Z-run is separated from G by infinitely many intervening Z-runs. However, this contradiction would not be of the slightest help to Zeno because, in absence of (Z1), (Z2) is unwarranted: no reason has been given to preclude the possibility of the runner's {reaching G} without having made a unique run that reached {G}. To be sure, this possibility is harshly counter-intuitive. But this is no reason for rejecting it out of hand.²⁹ For while no Z-run terminates at G, the runner can nevertheless approach G within any desired standard of approximation by making ever higher numbers of Z-runs: for any preassigned arbitrarily small, interval ϵ , there will always be a finite number, $\{n\}$ of Z-intervals whose sum differs from the length of SG by less than ϵ .³⁰ This is tantamount to saying that, even without making a unique run that reaches G at 10:01, the runner may nevertheless traverse in the preceding minute an interval which is *metrically indistinguishable from SG*.³¹ To do this, i.e., to traverse along SG an interval equal to SG, would be a perfectly good

construction of the argument: If the runner is at S at some initial instant, he cannot reach by running any other point on SG, unless he makes some run which begins at S. Cf. n.6 above.

²⁸ Cf. Thomson (above, n.11), p. 11.

²⁹ As I did in the work cited in n.1 above I have to thank Professor Ian Hacking, as well as Paul Benacerraf, for criticism which contributed to my discovery of the error.

³⁰ This would be the mathematical definition of SG as the limit of the partial sums of the infinite sequence of Z-intervals. Cf. M. Evans Munroe *The Language of Mathematics* (Ann Arbor, 1963), pp. 87-90; R. Courant and H. Robbins, *What is Mathematics?* (New York, 1941), p. 280ff. Here ϵ and n are variables quantified universally and existentially respectively. This requirement is crucial. It would be fragmentally false to say that there exists an n such that, for any ϵ that may be chosen, the sum of n Z-intervals differs from SG by less than ϵ .

³¹ And only set-theoretically different from it: the set of points the runner would cover if he made all (and only) the Z-runs would consist of all the points on SG except G itself; the intervals traversed would be, of course, the same.

way of "reaching G." This renders the contradiction between (Z2) and (Z3) quite useless for the purpose of discrediting (Z3). That (Z3) should be inconsistent with an unwarranted premise obviously casts no aspersion on its own logical merit

III

This discussion, I trust, has shown that it has yet to be proved on Zeno's behalf that the completability of an infinite sequence such as that of the Z-runs is a logical impossibility. Yet neither would anyone seriously suggest that a human runner (or even one with human powers heightened a billionfold) *could* execute such a set of discrete physical motions, whose parameters would become, before the end of the race, incomparably smaller than the smallest quantities known to subatomic physics. So the premise that vitiates Zeno's argument could not be the denial that the runner can perform this stupendous feat. What else then? Could it be the first premise in the above analysis of the argument, (1) in Section I above? Surely not. Since the runner is not allowed to skip any subsegment of SG, no matter how small, and since every Z-interval *is* a subsegment of SG, it is certain that he cannot reach G unless he traverses the whole of the Z-sequence or makes all of the Z-runs. But in order to do this, must he complete an infinite sequence of discrete {physical motions}? [This is what Zeno's argument assumes. Is the assumption warranted?] [102]

{Before answering this question, it is essential to call attention to a feature of Zeno's argument which I have so far ignored. The word *runs* was used in its premise (as formulated in Section I above) in a most unusual way. In common usage} this term individuates uniquely the physical action to which it applies—as much so as does "heartbeat" or "jab" or "revolution of the earth about its axis." Thus, if a man were to run without a break or let-up from S to G, the question, "How many runs did he make?" would have just one true answer: "One run." To say "Two runs," would be unequivocally false. So too, though no more so, would be "An infinite number of runs." This restriction was quietly ignored in the way "Z-runs" were defined above ("to make a Z-run" = "to run through a Z-interval"). For since the same interval can be divided conceptually in infinitely many alternative ways, it would follow that on *this* sense of "run" one and the same physical action, be it ever so smooth and uninterrupted, can be said to be as few or as many runs as suits our fancy. To mark the difference between these radically different uses of "runs," let us write "*runs_s*" for the familiar kind of physically individuated motions and "*runs_b*" for the other kind introduced here on Zeno's behalf. Then the single physical act which makes up the *run_s* from S to G could be described indifferently as one *run_b* (traversal of SG) or as two *runs_b* (say, traversals of SM,

MG) or, if we prefer large numbers, as a trillion *runs_b* (traversals of a trillion contiguous segments of SG, each of them a trillionth of its length) or, to please Zeno, as the \aleph_0 Z-*runs_b* (traversals of all the Z-intervals). Let us apply this diagnostic typography to (1) and (2) above. How shall we rewrite their "*Z runs*"? Since they are only traversals of Z-intervals, how else than as "*Z-runs_b*"? So rewritten, (1) turns out to be analytically true. But what of (2)? Why should there be the slightest difficulty about making the whole infinity of Z-*runs_b*, when all that is needed for this purpose is to make the single *run_s* from S to G—just as all that is needed to consume \aleph_0 parts ("parts_b") of an egg is to eat an egg, regardless of whether or not it is divided into parts_s, and, if divided, into how many parts_s? Has Zeno proved that the runner cannot make the SG run *unless he makes an infinity of Z-runs_s*? Obviously not!

One last line of counterattack is now left to Zeno. Conceding, as he now must, that he has not, and could not, prove that all the Z-*runs_s* must be made before the runner can reach G, he might point out that it would suffice for his purpose to prove the impossibility of making all of the Z-*runs_b*, all of which certainly would have to be made if the runner is to reach G. He could argue as follows: Though these Z-runs (we may drop the cacophonous subscript, now that it has done its work) are not physically individuated motions, neither are they arbitrary fictions. Each of them represents a determinate subsegment of the runner's total physical motion. Thus, to say that he made the 4th Z-run of a 600-yard run is to say that he traversed the distance from the 525th yard of the course to a point just 37-1/2 yards further, at times which could be easily computed if we know his speed. And since there is a Z-run for every subsegment of the run, all the Z-runs taken together constitute a correspondingly true description of the aggregate motion—one that would cover the whole of his run from S to G, accounting for every part of it exclusively in terms of Z-runs. "How so," Zeno could now ask, "when no Z-run reaches G? How could there be a true description of an event (the run from S to G represented solely in terms of Z-runs) whose occurrence entails [103] the fulfillment of a condition, *D* (that of making a run that reaches G), when the description entails the nonfulfilment of the condition (since none of the runs that figure in the description reaches G)?"

Here Zeno has fallen back on an assumption which [(in a slightly more elaborate form)] we have already met in (Z2) in Section II above: that in order to reach G the runner must make a run that terminates at G. Could any assumption be intuitively more compelling? Could anything seem more obvious than that, if a man is to reach a point by running, he will have to get there by a run that gets him there? But if we were to grant Zeno this premise, so harmless to all appearance, we would have lost the argument. For how could we then get out of the difficulty with which he has faced us? We might think we could do so by pointing out that *D* could easily be shown to be fulfilled by picking some other equally true description of the SG motion (e.g., as the one

run from S to G). But this maneuver would be futile. It would leave us with the paradox that D , known to have been fulfilled on this true description of the motion (i.e., as the SG run), would be known to have been unfulfilled [(not merely not known to have been fulfilled)] on another, no less true, description of the very same motion (the one which accounts for the whole of it exclusively in terms of Z-runs). To escape this paradox, we must reject the assumption on which its demonstration has been pegged. We must explain that while D is a sufficient condition of reaching G (the normal one, the only one we need think of in everyday experience), it is by no means a necessary condition, for the very reason we explained when we faced, and rejected, (Z2) above: On the Zenonian description of his motion in terms of Z-runs, the runner is (by hypothesis) in a position to make n Z-runs, where n , though finite, can be made as large as necessary to cut to less than any preassigned ϵ the difference between the sum of n Z-intervals and the length of SG. He will, therefore, have a way of reaching G that frees him from the necessity of complying with D . By making Z-runs, he can always go so far that no arithmetical sense could be given to the statement that he has *not* reached G. If no quantity could express the difference, δ , between the sum of n Z-intervals and SG (for δ could be made smaller than any ϵ that might be chosen), what arithmetical sense could there be in saying that there is a difference?

It should be hardly necessary to add that this solution could scarcely have occurred to Zeno, since it is an application of the conception of the sum of an infinite series as the limit of the sequence of the partial sums of that series—a conception which was not even reached by the greatest of Greek mathematicians, centuries after Zeno.³² If we had explained it to him, he might have reproached us with resorting to another paradox in order to escape his. "Not so," we would have demurred. "Ours only *seems* paradoxical, because it faults our intuition. Yours *is* paradoxical because it flouts our reason." But we need not [104] have grudged him admiration for the power of his invention. Not often in the history of thought has a puzzle been contrived whose brazen denial of a familiar truth can be successfully gainsaid only by the denial of another commonplace belief whose truth seems fully as certain: that the only way to reach a point is to make a unique motion which terminates at {(or beyond)} that point.³³

³² This conception is logically entailed by the method of "exhaustion" as used by Eudoxus in Books 12 and 13 of Euclid and by Archimedes in the *Quadrature of the Parabola*. But note that the correct use of this method (a) is not discovered until a century after Zeno and (b) is not identical with this conception. Thus while in Euclid 12, 2, the area of the circle is treated as the limit of the series of the areas of inscribed regular polygons of ever increasingly numerous sides, the limit is never treated as the *sum* of that series. See C. B. Boyer, *The Concept of the Calculus* (New York, 1939), pp. 32–37 and 51–53.

³³ For refutations of the Race Course which employ a distinction paralleling the one drawn between "runs_a" and "runs_b" and present interesting features of their own but fail to note the role

APPENDIX ZENO'S ACHILLES

This is that the slowest runner will never be overtaken by the swiftest: for the pursuer must always come first to the point whence the pursued started, so that the slower is always necessarily somewhat ahead (*proechein*; cf. *prouchontos*, *proxei* in frag. 1). (Aristotle, *Phys.* 239b15–18).

As Achilles starts from S toward A, the tortoise moves ahead from A. If she moves r times as fast (where r is a smallish fraction, say, $1/100$), then in the same time, t , Achilles takes to traverse SA (whose length is s), she will traverse AB ($= sr$). For the same reason, in the time (now tr) he takes to run through AB, she will traverse AC ($= sr^2$). So we get the following unending progressions

The Z-runs:	Run 1	Run 2	Run 3	...
The Z-sequences:				
For Achilles ("the ZA-sequence")	SA ($= s$)	AB ($= sr$)	BC ($= sr^2$)	
For the tortoise ("the ZT-sequence")	AB ($= sr$)	BC ($= sr^2$)	CD ($= sr^3$)	
The temporal sequence the same for both	t	tr	tr^2	

of the assumption expressed in (Z2) above, see G. Ryle, *Dilemmas* (Cambridge, 1954), p. 49, on construing differences of "division procedures" as differences in the objects to which they are applied, and Chihara (above, n.23), p. 86, on performing "a task which can be analyzed ad infinitum" vs. performing an infinite number of tasks. Cf. also H. Bergson, *Creative Evolution*, trans. A. Mitchell (New York, 1944), pp. 337–38, on the difference between taking a movement in accordance with its own "inward" articulation and treating it, on the other hand, "as we treat the interval passed through, decomposable and recomposable at will"; but here the resolution of the puzzle is predicated on Bergson's view of the indivisibility of "real" time and movement; see, *contra*, B. Russell, *The Principles of Mathematics* (London, 1903), pp. 800ff. (hereafter cited as *Principles*), and Grünbaum, "Relativity and the Atomism of Becoming," *Review of Metaphysics*, 4 (1950), 153ff. For a defense of Zeno along linguistic lines—as the Z-intervals get to be very small, we would no longer wish to call their traversals "runs"—see Black, *Problems of Analysis*, pp. 116ff., but why, on this construction, (1) and (2) above should have the slightest plausibility as reasons for (3) is not made clear. For a way of construing the Race Course, as well as the Arrow below, along entirely different lines which it has proved impossible to discuss here, though it has the very highest philosophical interest, see A. Grünbaum, "Modern Science and Zeno's Paradoxes of Motion" [which appeared originally in *Scientific American* 81 (1955), 234–39] (and see now Chapter 3 of his book, *Modern Science and Zeno's Paradoxes* (Middletown, Conn., 1967)).

The Argument:

(A1) Achilles and the tortoise are making contemporary Z-runs (i.e., such that their n th Z-run begins and ends at the same instant [$n = 1, 2, 3, \dots$]).

(A2) The n th Z-run of the tortoise and the $(n + 1)$ th of the Achilles traverse identical Z-intervals

(A3) Achilles will overtake the tortoise if, and only if, he makes some run reaching some point reached at the same instant by the tortoise. [105]

(A4) But, given (A2), at the end of any Z-run the tortoise will be one Z-interval ahead. Therefore, given (A3),

(A5) Achilles will never overtake her.

Aristotle remarks (ibid., 18–25) that the reasoning here is "the same" as in the Race Course, the only difference being the "theatrical" claptrap of the swiftest chasing the slowest and that here the progression is not formed by "dividing into half the distance still to be added," i.e., that $r \neq 1/2$. If we were to take this at face value, we would have to reduce the Achilles to something like

(1) To overtake the tortoise, Achilles must traverse all the Z-intervals

(2) It is impossible to traverse infinitely many intervals. Therefore,

(A5) As above.

This would make a plausible argument—no less so than the Race Course, whose exact replica it would be. But it would hardly be the same argument as the one depicted in Aristotle's own summary of the Achilles, cited above: There (A5) is derived directly from the fact that the two infinite sequences are synchronous, and so diabolically mismatched, that one of them is inexorably fated to keep ahead of the other. Here the same conclusion is derived from (2)—a proposition which corresponds to nothing whatever in Aristotle's summary of the Achilles, appearing only in his summary of the Race Course (263a6, cited above). The Aristotelian reduction must, therefore, be rejected on textual grounds: it does not fit the summary of the original argument supplied by Aristotle himself. For the same reason we must reject that interpretation of the Achilles, quite popular in recent philosophical discussions, which retains (2) above as the crucial premise, differing from Aristotle only in citing, as Zeno's reason for it, the alleged self-contradiction of completing an infinite sequence of acts.

Another interpretation, originally put forward by Broad (318–19), has enjoyed a considerable vogue.³⁴ It would reduce the Achilles to the following:

³⁴ E.g., B. Russell, *Our Knowledge of the External World* (London, 1914), p. 177 (hereafter cited as *Knowledge*); Ross, *Aristotle's Physics*, pp. 78–79; Lee Zeno of Elea, p. 77; J. Mau, "Zum Problem des Infinitesimalen bei den Antiken Atomisten," *Deutsche Akademie der Wissenschaften zu Berlin* (2nd edition, 1957), pp. 8–10; R. Baccou, *Histoire de la science grecque de Thales à Socrate* (Paris, 1951)

(3) If Achilles were to overtake the tortoise at some point, P, this point would be beyond the terminal point of any Z-interval.

(4) Since there are infinitely many Z-intervals, their sum is infinite. Therefore,

(5) To reach P would take infinitely long. Therefore,

(A5) As above.

Here (3) is, of course, strictly entailed by the construction: P is beyond the end point of any Z-interval but is approached, without lower bound, by the farther endpoints of successive Z-intervals. But (4) and its pendant, (5), are obviously not entailed; and neither are they mentioned or alluded to in Aristotle's summary of the argument. Here again we have a reduction that deals in a high-handed manner with the textual data. It imports premises which they do not supply. It spurns a premise which they do supply in the most explicit fashion at ibid., 239b16–18.

This leaves the field clear for the analysis of the argument I have offered [106] above, whose close fit on the data speaks for itself. The crucial premise, (A2), and the inference from it, (A4), merely formalize 239b16–18. (A1) and (A3) only articulate such logical supports as are strictly presupposed: Without (A1) the inference from (A2) to (A4) would be a transparent *non sequitur*. Nor will the inference from (A4) to the conclusion be viable without assuming (A3), as will appear directly.

Having reclaimed the distinctive logical structure of the Achilles, we can still offer an olive-branch to Aristotle: the solution of this puzzle *is*, as he says (ibid. 26), the same as that of the Race Course; for however different in design, it has been built from the same materials: sequences decreasing unendingly in constant ratio, whose members are intervals of space and time. The Z-runs are, as before,³⁵ runs_b, masquerading as runs_a. When they are unmasked (A1) and (A2) remain true by construction and (A4) a valid consequence. But does (A5) then follow? We know that the sequence of partial sums of the ZA-series and the same sequence of the ZT-series have a limit in P. If Achilles could make the SP run, the tortoise would make the AP run in precisely the same time, and she would be overtaken at P. Is there anything to stop them from doing just this, now that we see clearly that the Z-runs are not physically individuated motions and hence do not preempt in any way the physical exertions of the two runners? If not, Zeno loses the argument then and there. And there is no way he can hope to save it except to resort to the last-ditch tactics he used before³⁶:

If Achilles and the tortoise could traverse respectively SP and AP, their trajectories could be divided exhaustively into Z-intervals. So their motions along the whole stretch of each of their respective trajectories could be accounted for exclusively in

³⁵ Section III above

³⁶ In the third paragraph of Section III

terms of Z-runs, i.e. (in virtue of (A4)), as motions so synchronized that Achilles lags behind the tortoise *at every point* up to P. This true description of their physical motions will entail [that no run by either Achilles or the tortoise that starts before P will reach P (for every such run will be describable as a Z-run, hence as a run that does not reach P); it will, therefore, entail] that the condition stipulated at (A3) for Achilles' overtaking of the tortoise—a run by both of them reaching the same point at the same instant—will remain unfulfilled.

The answer is much the same as before:³⁷ Though no two contemporary Z-runs reach coincident points at the same instant, a Z-run can always be found which would bring Achilles as close to the tortoise as we please: for any preassigned ϵ there will be a finite number, m , such that the endpoints of Achilles' and the tortoise's m th Z-runs are less than ϵ apart (on the m th Z-run the tortoise traversing Z-interval sr^m , such that $0 < sr^m < \epsilon$.) Hence (A3) is false, and for the same reason as was (Z2) in the Race Course above: Achilles is in a position to make the difference between him and the tortoise less than any assignable quantity, however small—a perfectly good way of overtaking her, without each of them having had to make a unique run reaching P at the same instant.³⁸

³⁷ Fourth paragraph of Section III.

³⁸ The analysis of the Achilles defended here has some affinities with that in Russell, *Principles*, p. 350, and "Mathematics and the Metaphysicians," *The World of Mathematics*, ed. J. R. Newman (New York, 1956), pp. 1585–86 (the date of Russell's essay is not given). [107] and also with that found in A. Koyré, *Etudes d'histoire de la pensée philosophique* (Paris, 1961), p. 10–12. (It is not the same view as that adopted by Russell in *Knowledge*, p. 177.) The view defended has even closer affinities with the one given in P. Weiss, *Reality* (Princeton, 1938), p. 239, though there the view is accompanied by the claim that Zeno's conclusion is "inescapable" unless one accepts with Weiss an atomic theory of the nature of time. For a construction of the Achilles different from any of the above, see Owen "Zeno and the Mathematicians," p. 204, where Zeno is supposed (without textual warrant) to argue that if Achilles did catch the tortoise he would have traversed a last Z-interval. For a still different approach, see Grünbaum, "Relativity and the Atomicity of Becoming," pp. 236–38. For more extensive references to the scholarly literature on the Race Course and the Achilles and for further discussion of relevant philological questions, see M. Untersteiner, *Zenone* (Florence, 1963), pp. 120ff. [A shorter version of this discussion of the Race course and the Achilles appears in my article on Zeno of Elea in the *Encyclopedia of Philosophy*, edited by Paul Edwards (New York, 1967) (*1.248–53).]

A NOTE ON ZENO'S ARROW

1

[1] FOR IF, he says,¹

- [a] everything is always at rest when it is at a place equal to itself (ὅταν ᾗ κατὰ τὸ ἴσον).²
- [b] and the moving object is always [sc. at a place equal to itself]³ in the "now" (ἔστιν δ' αἰεὶ τὸ φερόμενον ἐν τῷ νῦν), then the arrow in motion is motionless. (Aristotle, *Phys.* 239b5–7; for the text see Ross 657–58) [3]

Originally published in *Phronesis* 11 (1966) 3–18. Reprinted in Furley and Allen II, pp. 184–200. Used by permission. The editor has made minor changes in punctuation, and has inserted n.20a as n.21, causing renumbering of remaining footnotes; original footnote numbers are one less than the present note numbers from that point on. Note numbers correspond to those of the reprint. (The bibliography at the end of the article may be consulted for complete documentation where briefer references are present in text or notes.)

I shall deal only with the main topics, and with these far from exhaustively. For more thorough treatments of the subject, the reader may consult works listed in the bibliography at the end of this article (to which reference is made in text and notes by the name of author only). For more extensive references to the scholarly literature, see M. Untersteiner, 142ff. Readers who may be familiar with the account of the Arrow in the chapter on Zeno I contributed to *Philosophie Classics*, Vol. 1, edited by W. Kaufmann (Englewood Cliffs, N.J., 1961), 27ff. at 40–41, are hereby advised that the present Note is meant to supersede it completely. That chapter had been prepared on short notice to fill an urgent pedagogical need and, as I explained at the time (27n.1), presented "purely provisional results of work-in-progress." The present Note incorporates results I have reached in a more thorough study of the Arrow made possible by a grant for research on Zeno from the National Science Foundation, to which I wish to express my thanks.

² I follow the usual translation of this peculiar phrase (cf., e.g., Burnet, "when it occupies a space equal to itself"). I assume that if Zeno had used this expression, his expansion of it would have been κατὰ τὸν ἴσον ἑαυτῷ τόπον, since *topos* would have been the only word he is likely to have used in this connection: cf. *topon allassein* in Parmenides, frag. 8.41 (DK). However, Zeno is more likely to have written ἐν τῷ ἴσῳ ἑαυτῷ τόπῳ, for the context suggests strongly that the construction with *kata* is Aristotelian. Aristotle starts talking of a mobile being *kata ti* as far back as 239a25, using the phrase again at 30, 34, 35 and (twice) at 239b3. Uninterested in conserving the mention of *topos* in his summary of the puzzle (*impos* plays no role in the analysis of its reasoning presupposed by his refutation), it would be natural for him to change ἐν τῷ ἴσῳ ἑαυτῷ into κατὰ τὸ ἴσον in conformity with his six uses of *kata ti* in the preceding fifteen lines.

³ For the expansion of the commentators (Simplicius, Philoponus, Themistius, Lee #30 to #34. Lee puts the expansion into the text (he writes: ἐν τῷ νῦν κατὰ τὸ ἴσον), but on frail MS authority.

[2] Zeno argues thus:

[a] A moving thing moves either [A] in the place in which it is or [B] in the place in which it is not.

[b] But it moves neither [A] in the place in which it is, nor [B] in the place in which it is not.

Therefore, nothing moves. (Epiphanius, *Adv. haer.* 3, 11; H. Diels, *Dox Graeci*, 590)

A briefer version of [2],⁴ practically identical with its part [b], is ascribed to Zeno by Diogenes Laertius (*Vitae philos.* 9, 72) in a passage in which he appears to be following a good source: all citations in 71–73 are reliable and most of them are letter-perfect. Of the two versions, this is the one likely to be the closer to the original: the longer one in Epiphanius looks like an expansion of this one to make it “compl[y] with the rules and conventions of post-Aristotelian syllogisms” (Fränkel 7). In any case, the ascription of [2b] to Zeno has the backing of both Diogenes and Epiphanius, and I know of no good reason to doubt it. It is true that Sextus, reporting on three separate occasions (*Pyrrh. hyp.* 2, 245 and 3, 71; *Adv. math.* 10, 86–89) the use of [2] (with variations) by Diodorus Cronus,⁵ never mentions its Zenonian authorship. But neither does he say that Diodorus was its originator; he seems to imply the very opposite, as Fränkel (7n.20) has observed, by introducing the argument in one passage with the remark that Diodorus τὸν περιφορητικὸν συνερωτᾷ λόγον εἰς τὸ μὴ κινεῖσθαι τι (*Adv. math.* 10, 87; cf. Fränkel 7n.20).⁶ Sextus’ failure to cite Diodorus as the inventor of this argument could hardly count against its authenticity: he is as silent concerning the authorship of the other argument whose use by Diodorus he reports in the same connection⁷—that if time consists of indivisibles, “has moved” will be true of things of which “is moving” was never true—which we know as one of Aristotle’s cleverest and most characteristic creations (*Phys.* 231b20ff.). [4]

Once we decide that on the evidence [2b] was Zeno’s (the sense, if not the exact wording), we should face the question, Could it really have been a self-contained composition, independent of [1], as the editors have generally assumed? Suppose it were. What would we then make of Aristotle’s remark that “there are four arguments by Zeno that give trouble to those who try to refute them” (239b9–11)? On the hypothesis, [2b] would have been a fifth. Why then did Aristotle ignore it? Because he thought it a silly puzzle not worth

solving, or too easily solved? This would be hard to square with the fact that Diodorus, connoisseur of fine arguments, thought so well of it. Nor is it likely on aesthetic grounds that a construction trenching so closely on the Arrow should have appeared in Zeno’s book as a separate puzzle. And there is a third, still stronger, reason for rejecting the hypothesis: As [2b] now stands, it makes at [A] a challenging claim—that a thing cannot move *en hōi esti topōi*—without putting up the slightest defense for it. To realize how badly it does need defense, one need only recall that it would be quite consistent with general usage in Zeno’s time (and for a long time after) to think of the *topos* in which a thing is as the room or region *within* which it stands or moves—i.e., as its locale, rather than its precise location.⁸ Hence to be told out of the blue that a thing cannot move “in the place in which it is” would only provoke the retort, “And why not? Why cannot the dog move in the kennel, the man in the courtyard, the ship in the bay?” If we take another look at [1a] with this in mind, its aptness as an answer to just this objection leaps to the eye: Its strategy is to cut down the thing’s “place” to a space fitting so tightly the thing’s own dimensions (just “equal” to its own bulk) as to leave it no room in which to move. Thus [1a] locks neatly into [2bA] in point of logic, while if it belonged to a separate argument we would have to suppose that Zeno had built into the original of [2] some other backing for [2bA]—and what would that be? In three of the passages⁹ in which [2] turns up in Sextus, the backing for it is just, “for if it is in it [*sc.* the place in which it is], it rests there.” This would be very lame—a patent begging of the question—unless here again the equivalent of [1a] were being presupposed. And that this is in fact the case appears from a fourth passage in Sextus (*Adv. math.* 10, 86), where the equivalent of [1a] [5] is given as Diodorus’ reason for [2bA]: “and that is why [the body] moves neither in it [*i.e.*, the place which contains it]—*for it fills this up*, while it needs a larger place in which to move—nor etc.” The fact that the cited argument is loaded with the special assumptions of Diodorean physics (the body is an indivisible which, if it could move, would have to move through a space composed of indivisibles) in no way affects the point at issue, i.e., that Diodorus too, when filling out the argument in [2bA] to make it fully convincing, resorted to precisely the same reasoning as is provided, more tersely, at [1a] in the Aristotelian summary of the Arrow. This being the case, and taking also into account the first two reasons above against the hypothesis that [1a] and [2bA] belonged to separate puzzles, we have good warrant for rejecting it in favor of the assumption—on which the rest of this Note will proceed—that both [1a] and [2b] belonged to the Zenonian original of the Arrow. Their subsequent separation in Diogenes Laertius and Epiphanius (or their sources)

⁴ Printed as frag. 4 in DK, with no defense of the editorial decision.

⁵ Also in *Pyrrh. hyp.* 2, 242, without ascription to Diodorus or to anyone else.

⁶ Just before, at 86, Sextus had given a fuller account of the reasoning by which Diodorus had supported [2bA] and [2bB]. It would be hard to believe that, when he goes on to cite the whole of [2] in the next paragraph, he should refer to it in the above terms (note specially the force of *sunerotai*), if he had thought of [2] as a Diodorean invention.

⁷ *Adv. math.* 10, 48 and 85, it is connected closely with [2b] in the latter passage.

⁸ Many examples of the wider usage in LSI, s.v. τόπος.

⁹ *Pyrrh. hyp.* 3, 71 and *Adv. math.* 10, 87, also in *Pyrrh. hyp.* 2, 242 (cf. n. 5 above); but not in *Pyrrh. hyp.* 2, 245, where the argument is tailored to fit the joke.

could be accounted for easily: in the former, a truncated version of the Zenonian original; in the latter an expansion of that fragment.

Nor would it be hard to account, on the same assumption, for Aristotle's quite different version of the Arrow. We need only suppose that he recognized in [1a] and [1b] the significant part of the argument and scornfully ignored the rest: witness his drastic abbreviation of the Race Course in the same passage (239b11–13).¹⁰ That he should have kept [1a] is understandable: on any reconstruction of the puzzle, this is the heart of its reasoning. As for [1b], all of this too might well have figured in the original as the sequel to [2bA] duly backed by [1a] (see the conjectural reconstitution of the argument below), except for its mention of the *nun* at the end.¹¹ This is one of Aristotle's favorite technical terms. He used it commonly as a name for the durationless instant,¹² but occasionally, in controversial contexts, he also allowed [6] himself to use it to denote the atomic quantum of duration, integral multiples of which would make up all larger temporal intervals, if time were discontinuous.¹³ Since neither of these two uses of *nun* has known precedent,¹⁴ it would be most unsafe to assume that Zeno had anticipated one of them across a gap of a hundred years or more. Its presence here is explicable as an Aristotelian plant: by sticking it into his account of the puzzle, Aristotle makes it all the easier for his readers to feel the appositeness of his refutation, which centers in the claim that "it [Zeno's argument] assumes that time is composed of 'nows': if

¹⁰ Cf. this with the considerably fuller, though still abbreviated, account of the same argument at 263a5–6.

¹¹ Cf. Calogero 131–38.

¹² How much of an Aristotelian innovation it is one can see by comparing Platonic usage. For Plato the "now" remains an interval; he uses *to nun* as short for *ho nun chronos* (*Parm.* 152b5). The closest he comes to Aristotle's instantaneous "now" is in something he calls the *exaiphnēs*, "this queer thing situated between motion and rest, not itself in any time [Cornford, comparing *E.N.* 1174b8, "it occupies no time at all," i.e., has no temporal stretch], while *to* it and *from* it the moving changes to a state of rest and the resting to a state of motion" (*Parm.* 157d6–e3). Thus Plato's *exaiphnēs* is a limit of temporal extension, itself extensionless; and one might wonder if this, in all but the name, is the Aristotelian "now." But there are great differences: Plato does not explicate in rigorous terms the concept he has in mind, does not elucidate it as the temporal analogue of the geometrical point (so fundamental for Aristotle's analysis of the "now" *Phys.* 231b6ff. *et passim*), does not specify its formal properties (especially the crucial one, of nonconsecutive succession, so clearly identified by Aristotle for the "now," 218a18 *et passim*). Aristotle is at pains to distinguish his *nun* from the *exaiphnēs*, remarking (perhaps with implied opposition to Plato's use of the term) that the latter refers to what happens in an imperceptibly small [stretch of] time, *Phys.* 222b15. Cf. Owen 2, 101ff.

¹³ For this second usage (united with the first by the fact that the durationless "now" is *also* indivisible, but never confused with it by Aristotle to my knowledge), see, e.g., the argument against the thesis that time and motion (no less than spatial extension) "are composed of indivisibles," 231b18ff., at its conclusion he represents the refuted thesis as holding that time "is composed of 'nows' which are indivisible" (232a19).

¹⁴ There is no hint of the latter in Plato (*Parm.* 152aff.: 155d) and certainly none of the former (cf. n 12 above).

this were not granted, the argument would not be valid."¹⁵ If it did not have this function, it is doubtful that Aristotle would have found a place for it in his ultra-compressed account of the puzzle, even if it had figured in the Zenonian original. How expendable it is becomes apparent in a number of the summaries of the argument in the Aristotelian commentators: though undoubtedly dependent on our present Aristotelian passage, they drop the "now," probably not even aware that they have done so, and certainly not expecting that their [7] readers would miss it.¹⁶ It becomes quite superfluous to the sense and to the force of the reasoning when [1a] and [1b] (the latter with modifications) are spliced into [2b], with a transitional sentence added to smooth out the reasoning.

[A moving arrow moves either in the place in which it is or in the place in which it is not (= [2a]).]

[But it] could not move in the place in which it is not (= [2bB]).¹⁷

But neither could it move in the place in which it is (= [2bA]).

For this is a place equal to itself [supplied].

And everything is always at rest when it is in a place equal to itself (= [1a]).

[But the flying arrow is always in the place in which it is ([1b] with modifications).]

Therefore, the [flying][moving] arrow is [always at rest][motionless].

Pending a fuller, or better grounded, utilization of our textual data, it is reasonable to assume that some such argument was the original of the Arrow.¹⁸

239b31–33; cf. b8–9. That "time is *not* composed of indivisible 'nows'" (*loc. cit.*) is the very foundation of Aristotle's theory of the temporal continuum. He announces it (218a8) early in the second paragraph of his essay on time (*Phys.* 4, 217b29ff.) and reintroduces it in the first chapter of *Physics* 6; cf. n. 13 above.

¹⁶ Of the three summaries of the Arrow in Simplicius, the longer one (*Phys.* 1011, 19ff. = Lee #31) includes the "nows," but the shorter ones (1015, 19ff. = Lee #30; 1034, 4ff. = Lee #32) do not. Philoponus (*Phys.* 816, 30ff. = Lee #33) conserves the "now." Themistius does not in *Phys.* 199, 4ff. = Lee #34 or in 200, 29ff.

It is, therefore, possible that a reason may have been given for this proposition – such as the one in the versions of [2] which Sextus ascribes to Diodorus in *Pyrrh. hyp.* 3, 71 and 3, 89: "for it can neither do nor suffer anything where it is not."

[A trivially different version, sticking more closely to Aristotle's [1b] at the price of a slight roughness in the transition from [2bA] to [1a], would repeat the first two premises as above and then proceed as follows:

For everything is always at rest when it is in a place equal to itself (= [1a]).

And the flying arrow is always in a place equal to itself (= [1b] without *en tōi nun*)

Therefore, the flying arrow is always at rest.]

[To make maximum use of the materials in the Aristotelian version one could interpolate

But the moving arrow is always in the place in which it is (= [1b] with modifications).

Immediately after the conclusion. I did so in the reconstruction I offered in this paper in *Phronesis* and subsequently in my article on Zeno in the *Encyclopedia of Philosophy* (ed. Paul Edwards

II

Why should Zeno have thought [1a] true? There are two possible answers, depending on how we read its "when" (Cf. Black 128 and 144–46). Is Zeno saying

(I) that everything is at rest *for any temporal interval during which* it is "at a place equal to itself,"

or

(II) that everything is at rest *for any (durationless) instant¹⁹ in which* it is "at a place equal to itself"? [8]

Could (I) be the right reading? Its linguistic plausibility is so great that the second sense of *hotan* might not even occur to one here,²⁰ as it apparently did not to Aristotle: he seems to have taken it for granted that the *hotan* in [1a] would refer to a stretch of time.²¹ But there is a strong objection to this reading: it would require us to debit Zeno with a gratuitous fallacy. For only if we know that an object is *in the same place* for some stretch of time, would be entitled to infer that it is at rest during that stretch. And that is just what we do not know in the case of the arrow. To all appearance it is never in the same place in the course of its flight during any sizable period. Is there then any reason to think that it would be in the same place during smaller periods? On

[New York, 1967], pp. 369–79, at p. 374 (**1.253)). But it is now clear to me that this is, strictly, a redundancy: there is no reason for it once the disjunction "moves either in the place in which it is or in the place in which it is not" has been set forth, its second disjunct demolished in the second step, and its first disjunct demolished in the third and fourth steps. [1b], of course, is *not* a redundancy in Aristotle's version of the argument, where the disjunction and elimination of the second disjunct have dropped out }

¹⁹ Hereafter I shall always mean "durationless instant" when I say "instant."

²⁰ Cf. the behavior of LSJ. Elucidating the "when, at the time when" sense of ὅτε (ὅτε ἄν ὅτε), the authors say that it is used in the indicative with imperfect or aorist "to denote single events or actions in past time," with present "of a thing always happening or now going on," etc. They make no provision here or subsequently in any of their statements or examples for sense (II) above, i.e., for the use of *hote* to refer not to an event or a period but to an instantaneous limit of an event or period, e.g., to the start or finish of a race. This rarer, but perfectly authentic, sense of *hote* has evidently not occurred to the original authors or later editors of the dictionary.

²¹ [20a in original article] I think we may infer from the context (239b1–4) that the "indivisible nows" which Aristotle believes (ibid. 8–9; 31–33) are being "assumed" by Zeno's argument are atomic stretches, not extensionless instants (i.e., that he is using the *nun* in the second of the two senses in which he employs the term: cf. n.13 above). For since he says that there is neither motion nor rest in a "now" in 239b1–4, where he is using "now" in the sense of *instant*, the assumption that time consists of instants would have warranted in his view the conclusion that the flying arrow is *neither moving nor resting*. But he says (ibid. 30–32) that the assumption warrants the conclusion that the arrow is *resting*. So unless he is being very careless, he must be thinking of the "nows" of the supposed assumption not as instants, but as atomic durations.

the face of it, none whatever: there is no more reason *a priori* why the flying arrow should be in the same place for a billionth of a second than for a whole second. So if Zeno wanted us to believe the contrary, he would have to give us his reason. Otherwise, he would be begging the very question to be proved—that the arrow, moving by hypothesis, is in fact resting—and to beg it for smaller periods would not make the offense to logic the smaller.²² Now on the present reconstruction of [9] Zeno's argument, there is absolutely nothing—not one word—to say, imply, or even suggest, that he was offering us some reason for believing that the flying arrow stays put for tiny intervals. Hence the only possible way of bringing any such premise into the argument would be to assume that this is something which Zeno's reader *already believes*, so that Zeno does not have to argue for it, or even mention it: he can just take it for granted.

Under the influence of Paul Tannery (249ff.), a number of distinguished scholars have made just this assumption. Supposing (T, i)—"T" in honor of the father of this hypothesis—that Zeno's arguments were directed against Pythagoreans whom they supposed (T, ii) to hold a remarkable doctrine, called "number-atomism" by Cornford, these scholars have also supposed (T, iii) that Zeno's opponents believed that time, no less than matter and empty space, was made up of indivisible quanta. Elsewhere²³ I have argued against (T, i) and (T, ii). This is not the time to resume that argument. But it might be just as well to remind the reader that that protest (preceded by such fundamental work as that of Heidel, 21ff., Calogero 115ff., and van der Waerden 151ff.) has been sustained in several later contributions (including Owen, 1, 211ff.; Booth 90ff.; Burkert 37ff., 264ff.; Untersteiner 197ff.) However, (T, i) and (T, ii) were at least put forward on the basis of presumptive textual evidence. In this respect they are in a totally different category from (T, iii), for which not a single item of positive textual evidence has ever been offered. Aristotle's last-quoted remark does not constitute such evidence. For neither here (i.e., 239b8–9 and 31–33) nor anywhere else does Aristotle say, or even suggest, that this or any other argument of Zeno's was directed against Py-

I am not implying that the hypothesis is that the arrow is moving over every interval, however small. It would be quite legitimate to hold that the hypothesis is, as such, noncommittal about motion over micro-intervals and does not exclude *a priori* the possibility that motion might be discontinuous after all. But to assert (I) Zeno would have to go much further than profess agnosticism as to motion or rest over micro-intervals, he would have to assert *rest*; and this would be begging the question.

Review of J. E. Raven, *Pythagoreans and Eleatics* (Gnomon 25, 1953), 29–35 at 31ff. (1953) (review of G. S. Kirk and J. E. Raven, *The Presocratic Philosophers*) PR 68 (1959) 341–35 at 337ff. (my article on Zeno of Elea in the *Encyclopedia of Philosophy*, at p. 376 (**1.257), where I point out that wherever Aristotle speaks of fifth-century thinkers who "introduce" or expound "atomic magnitudes," he refers exclusively to the Ionian atomists, with the suggestion that the Pythagoreans had an equivalent or comparable doctrine: see, e.g., *Phys.* 187a23; *De caelo* 303a4–6; *De gen. et cor.* 315b26–317a1, *De sensu* 445b18.)

thagorean philosophers.²⁴ Nor does Aristotle tell us here that Zeno said (or claimed, maintained, etc.) that time is composed of "indivisible nows." His remark can be read perfectly well as only tracking down the assumption which, in Aristotle's own judgment, was logically entailed by Zeno's argument and would have to be added to its premises, to validate the conclusion.²⁵ If I were to say, "In arguing that [10] *P* entails *Q*, you are assuming the truth of *R*," I would not be implying, and might not even wish to suggest, that you already believe *R*. All I could be, strictly, understood to imply is that, since "*P* entails *Q*" entails *R*, you cannot maintain the former unless you are also prepared to stomach the latter. Therefore, if one wished to cite Aristotle as a witness of Zeno's profession of the discontinuity of time, one would have to produce other evidence tending to show that Aristotle wished us to understand his remark as ascribing such a doctrine to Zeno. Such evidence does not exist. That the quantization of time was espoused by Zeno himself or by his Pythagorean contemporaries thus remains a pure conjecture,²⁶ and a most implausible one: so abstruse a speculation as the replacement of the temporal continuum by an atomic conception of temporal passage could not have been seriously entertained, let alone professed, until well after the much more concrete hypothesis of the atomic constitution of matter had become thoroughly assimilated by the philosophical imagination, i.e., well after Zeno's time.²⁷ So we can be confident that if Zeno had expected his readers to concur with (I), he could not have presumed on their doing so because of their antecedent philosophical commitments; he would have had to produce an argument for (I), if that is what he was asserting by means of [1a]. Since there is no trace of such an argument, we have good reason to discount this first reading of the "when."

(II), on the other hand, allows a viable, and very simple, explanation of the fact that Zeno thought [1a] true, and so plainly true that he felt no need to argue the point or even so much as mention it as his reason for [1a]; if we think of the arrow as occupying a given position for a time of zero duration, it will be obvious enough that it cannot be moving just *then*: it will have no time in which to move.²⁸ To derive [1a] we will then require only the following premise:

²⁴ Nor is any such thing said, or suggested, by Eudemus or by any other ancient authority.

²⁵ This, I trust, is all Lee (78) means in saying that Aristotle here "points out . . . the necessary presupposition of the argument."

²⁶ For the "suggestion" that this was "a Pythagorean formulation, arising out of their point-atom theory" see Lee 105–6.

²⁷ For this reason among others, I would reject the interpretation of the fourth Zenonian paradox of motion as an argument against temporal indivisibles. Cf. p. 43n.31 of my essay cited in n. 1 above, and note that this interpretation of the paradox is unheard of in antiquity and goes flatly against the one which all of our ancient authorities take to be the obvious sense of the paradox.

²⁸ Cf. Black 133–34, the first four paragraphs of this exposition of what he calls "a modern version of the paradox."

H If the arrow is not moving when it is "at a place equal to itself," it must be at rest at that place. [11]

This hypothetical is the crucial tacit premise of the puzzle. If this were granted, [1a] would certainly follow, and the success of the whole argument would be assured.²⁹ How then would *H* have struck Zeno? Would it have looked to him a hazardous inference in need of argumentative support? I shall try to convince the reader—if he does need to be convinced—that, on the contrary, it would have seemed to him trivially true.

Let me begin by pointing out that even today most people (perhaps even some readers of this journal!) would think it so. Here is one example from a distinguished modern philosopher: "If a flying arrow occupies at each point of time a determinate point of space, its motion becomes nothing but a sum of rests" (James 157)—presumably because occupying a point of space at a point of time entails the antecedent of *H* and *therefore* is consequent. Evidently it has not occurred to James that *H* involves a substantial inference—and an invalid one.³⁰ Yet James had at his disposal tools of analysis by means of which he could easily have satisfied himself that *H*, so far from being tautologically true, is certainly false. Its antecedent is indeed true, the arrow does not move when (i.e., in the instant of zero duration at which) it occupies a space equal to its own bulk. But its consequent is false (in the broader sense in which "false" covers senseless statements no less than significant falsehoods): to say that the arrow is at rest for an instant is, strictly speaking, senseless. This can be established, for example, by means of the familiar $v = s/t$ formula (*v*, velocity; *s*, distance; *t*, time). Since a body at rest has zero velocity and covers no distance, the values required for *v* and *s* to represent the state of rest will be zero. On the hypothesis that the body is at rest in an instant, the value of *t* will also be zero, and we will then get $v = 0/0$, i.e., arithmetical [12] nonsense. The only way to get the required $v = 0$ is to assign a value greater than zero to *t*, i.e., to represent the body as being at rest during some *temporal interval*, however short.³¹

In *Physics* VI (234a32–b7; 239a11–17) Aristotle reached an equivalent

²⁹ It might be thought that [1a] could be granted and the conclusion escaped by arguing that even if at rest in each instant the arrow need not be at rest during the whole of its flight. This would be a mistake. If we conceded sense and truth to the statement that the arrow is at rest in each instant of its flight, we would be admitting that the whole period of the flight can be accounted for in terms of rest, which would be only another way of saying that the arrow is at rest throughout the whole period. Cf. Owen 1, 216–17.

³⁰ A good, clear statement of its error in Chappell 203: "What is at rest is motionless, but we can not enter that what is motionless is at rest without the added premise that it is motionless through a period of time, or at more than one moment [= instant] for a single moment there is neither motion nor rest."

³¹ A perfectly good sense may nonetheless be given to "instantaneous rest" as a *limit*: cf. the explanation of "instantaneous velocity" in Section III below.

result without benefit of algebra by a conceptual analysis of the "now." He demonstrated that, since "resting consists in being in the same [place] in some [interval of] time" (239a26), it follows that

(1) in any "now" there can be neither motion nor rest: it is only true to say (2) that [any body, whether moving or resting] is not moving while it is over against something [i.e., while having a determinate position] in a "now", but (3) it would not be the case that [any body, whether moving or resting] could be over against a stationary body in a [period of] time: for if the latter were the case [i.e., if a body had a determinate position for some temporal interval, however small], then a moving body would be at rest (239b1–4).

Here at last we do get the denial of *H* we have been looking for: It is implied in (2) that the antecedent of *H* is true (the arrow would not be moving in the "now") and in (1) that its consequent is false (the arrow would not be at rest in the "now"). But this comes only at the high point of an intensive exploration of temporal concepts, begun in the *Academy*,³² and continued with rare diligence and penetration in the *Physics*. And even so, for all the brilliant advance in insight this treatise represents, it does not take Aristotle far enough to enable him to understand clearly the fact that the antecedent of *H*, though certainly true, is true not for physical, but semantic, reasons.³³ The sense in which the arrow is not moving in any instant is vastly different from that in which the Rock of Gibraltar is not moving in any day, hour, or second. To say that the Rock is moving in some period would be merely false. To say that the arrow is moving in any instant [13] would be (strictly speaking) senseless:³⁴ it is non-moving and non-resting in the same way in which, e.g., a point is non-straight and non-curved, non-convex and non-concave—the predicates are not falsely applicable, but inapplicable. If this is not understood, the antecedent of *H* will itself seem fully as paradoxical as its consequent and will provoke the question, "But if the arrow is not moving in any given instant of its flight, *when* and *how* does it manage to move?" To answer this question, one must expose the confusion lurking behind the expectation that, if the arrow is to move at all, it must move in the instant. One must point out that to ask, "How can the arrow be moving during an interval when it is non-moving in every instant contained by that interval?" would be like asking, "How can the

³² Cf. Owen 2, 92ff.

³³ Some readers may think I am underestimating Aristotle's insight at this point. They may retort that since Aristotle has come to see that a body is neither moving nor resting in an instant (while knowing all too well that a body must be either moving or resting during an interval), he must have grasped the semantic difference in the two types of assertions. I am not questioning that Aristotle has *some* understanding of the difference. All I am claiming is that it is not extensive enough to enable him to (i) state formally the crucial point (in some such way as I proceed to do above or in some logically equivalent way) and, therefore (ii) see its full implications for questions of immediate concern to him. The second deficiency will be apparent in n. 36 below.

³⁴ As much so as would the 0/0 result for v in the formula above, and for parallel reasons.

arc be curved when none of its points are curved?" Motion (or rest) apply to what happens not in individual instants but in intervals (or ordered sets of instants), as curvature is a property not of individual points but of lines and surfaces (or ordered sets of points). Only when this has been understood will one be in a position to see that the arrow's non-moving in any given instant is absolutely irrelevant to its moving or resting during some interval containing the given instant,³⁵ and that conversely the arrow's moving (or resting) during a given interval allows no inference whatever that it is moving (or resting) in any instant contained by that interval.³⁶ [14]

We may now return to Zeno. It should now be clear that to see the falsehood of *H*, or even to suspect it, he would have needed to possess a clear-cut understanding of the instant/interval distinction and to bring this to bear on *H* (in spite of the fact that it does not mention "instants"), thereby realizing that its evident truth for intervals is not the slightest reason why it should be true for instants. Zeno's ability to meet this condition may be gauged from the fact that, in all probability, he did not even have a term for "instant" and could only get at this concept indirectly by thinking of what would happen to the time of the flight "when" the arrow was "at a place equal to itself," i.e., by thinking of duration cut to zero as the distance traversed was cut to zero. Is it surprising if in such circumstances he should have thought of the arrow's being *at rest* in such a time as being no more than verbally different from its *not moving* in it, and therefore felt as certain of the former as he was entitled to feel of the latter?³⁷

³⁵ And, therefore, that the disjunction in [2a] is not exhaustive: it stops short of a third possibility which (stated with pedantic completeness) would run: "or [C] from the place, p_0 , in which it is at a given instant, t_0 , to a place, p_1 , in which it is not at t_0 during an interval which contains both t_0 and the later instant, t_1 , at which it is at p_1 ."

³⁶ While certainly allowing the inference that it is moving (or resting) *at* any instant contained by that interval. This—and the implied distinction between motion (or rest) *in* (or *for*) an instant (which is senseless, as has just been explained) and motion (or rest) *at* an instant (to which sense can and must be given, cf. Section III below). Aristotle totally failed to grasp (or positive evidence of this failure, see *Phys.* 236a15ff., where he is dealing with a period of rest, CA, immediately followed by a period of change, AD, with A as the boundary instant common to the two periods. He remarks that if something were at rest throughout CA, it would follow that $\alpha\tau\tau\epsilon\iota\tau\epsilon\iota$ $\alpha\tau\tau\epsilon\iota\tau\epsilon\iota$ $\alpha\tau\tau\epsilon\iota\tau\epsilon\iota$ $\alpha\tau\tau\epsilon\iota\tau\epsilon\iota$ 18. This inference is, of course, correct (in the sense that it *erone* *at* *time* *not in or for* *instant* A). But it appears to be in flagrant contradiction with Aristotle's formula doctrine that *en to nun* is impossible *en to nun* (234a32–34, and cf. the citation from 239b in the text above). To get around the apparent inconsistency, Aristotle would have to understand *en to nun* in the sense of *en* in 236a18 (where *en to A* = "at instant A") from, e.g., $\epsilon\gamma\gamma\epsilon\iota\tau\epsilon\iota$ $\epsilon\gamma\gamma\epsilon\iota\tau\epsilon\iota$ $\epsilon\gamma\gamma\epsilon\iota\tau\epsilon\iota$ $\epsilon\gamma\gamma\epsilon\iota\tau\epsilon\iota$ 234a34 (where *en* = "in" or "within") i.e., *for* *a given instant*.)

³⁷ It should be evident on inspection that in the Zenonian argument as reconstructed above (end of Section I) "not moving" and "resting" are being used as logically equivalent expressions; so, at the third step where the arguer says "cannot move" through his inference, if valid, would be entitled him to say "must be at rest." But I am not entering this as evidence for the above conclusion, since the extent to which the relevant texts have preserved Zeno's original wording is unknown.

III

We saw above what William James made of the Arrow. Here is one of Bertrand Russell's glosses on it (2, 1582):

Philosophers often tell us that when a body is in motion, it changes its position within the instant. To this view Zeno long ago made the fatal retort that every body always is where it is; but a retort so simple and so brief was not of the kind to which philosophers are accustomed to give weight, and they have continued down to our own day to repeat the same phrases which roused the Eleatic's destructive ardour. It was only recently that it became possible to explain motion in detail in accordance with Zeno's platitude, and in opposition to the philosophers' paradox

Here Zeno is given credit for having grasped the following truth: If time-specifications are made not in terms of temporal intervals, but in terms of instants, then it is possible to say that a moving body [15] is at one and only one place at any given instant just as unambiguously as we can say this of a body which is at rest. This insight liberates the philosopher from the idea of an instantaneous state of motion³⁸—an idea which, though (strictly) nonsense, is not obvious nonsense. For we do say such things as "the ship is now moving at the rate of ten miles per hour," meaning by "now" "at this instant," and our dynamics cannot dispense with the notion of "instantaneous velocity." How so, if the instantaneous state of motion makes no sense? How could motion at an instant make sense, if motion *in* (or *for*) an instant does not? It was only with the greatest labor and after many false moves that it was found possible to give a satisfactory answer to this question—"to explain motion in detail in accordance with Zeno's platitude"—by showing that "velocity at instant, *i*" can be understood to mean no more than the *limit* of average velocities over intervals approaching zero and always containing *i*, where "approaching zero" can be defined without covert appeal to an instantaneous state of change (or to its mathematical twin, the infinitesimal) by employing only variables quantified over intervals of finite length: the set of intervals containing *i* approaches zero if, and only if, for any preassigned, arbitrarily small, interval ϵ , there is always a member $\{m\}$ of the set such that [the difference between its length and zero is less than ϵ] $\{0 < m < \epsilon\}$

We may be grateful to Russell for helping us see how important and [16] how true is that insight he has called, with pugnacious understatement, "Zeno's platitude." With our own analysis of the texts behind us, we need not be disturbed by the accompanying historical fable.³⁹ If the foregoing inter-

³⁸ I.e., of a motion which is accomplished *in*, or *within*, an instant (cf. the first sentence in the citation from Russell).

³⁹ Russell's most frequently cited gloss on Zeno—1.347ff.—the historical fable and further leg-pulling of the "philosophers"—is a brilliant piece of writing and would be wholly delightful if it were not confusing for those who are not fully up to Russell's tricks (see, e.g., what poor James made of it, 186n.1). Here Russell tells us that Zeno (and Weierstrass following unknowingly in

pretation is correct, Zeno has indeed seen that the arrow does not move in a given instant. But he could only have had a faint glimmering of what this means, else he would not have jumped to the conclusion that it must be resting at that instant and during all intervals containing that instant and that all bodies must be resting during all intervals containing all instants. Recognizing Zeno's mistake, we need not belittle his achievement. Zeno's paradox is not a bad first move in the direction of "Zeno's platitude."⁴⁰

BIBLIOGRAPHY

- Black, M. *Problems of Analysis* (Ithaca, 1954).
 Booth, N. B. "Were Zeno's Arguments Directed Against the Pythagoreans?" *Phronesis* 2 (1957), 90–103.
 Burkert, W. *Weisheit und Wissenschaft* (Nürnberg, 1962).
 Burnet, *Early Greek Philosophy*, 4th edition, London, 1930.
 Calogero, G. *Studi Sull' Eleatismo* (Rome, 1932).
 Chappell, V. C., "Time and Zeno's Arrow," *JP* 59 (1962), 197ff.
 Frankel, H. "Zeno of Elea's Attacks on Plurality," *AJP* 63 (1942), 1ff. and 193ff. (trans. into German in *Wege und Formen frühgriechischen Denkens* [Munich, 1955], 198ff.).
 Heidel, W. A. "The Pythagoreans and Greek Mathematics," *AJP* 61 (1940), 1ff.
 James, William, *Some Problems of Philosophy* (New York, 1911).
 Lee, H. D. P. *Zeno of Elea* (Cambridge, 1936).
 Owen, G. E. L. (1) "Zeno and the Mathematicians," *Proc. Arist. Society* 58 (1957–58), 199–222.
 Owen, G. E. L. (2) "Tithenai ta Phainomena," "Aristote et les problèmes de méthode" (papers presented at the Symposium Aristotelicum held at Louvain in 1960) (Louvain, 1961), 83–103.
 Ross, W. D. *Aristotle's Physics* (Oxford, 1936).
 Russell, B. (1) *Principles of Mathematics* (London, 1903).
 (2) "Mathematics and the Metaphysicians," in *The World of Mathematics*, ed. J. R. Newman (New York, 1956); the date of Russell's essay not given. [17]

Zeno's footsteps) has proved "that we live in an unchanging world and that the arrow, at every moment [— instant] of its flight, is truly at rest"—this on the strength of the fact that Zeno is supposed to have proved that there is no instantaneous state of change (= "Zeno's platitude" above), as though this entailed the vastly different propositions that there are instantaneous states of rest and that the moving arrow is always in one of these! For still another Russellian analysis of the Arrow, see 4, 805, here Zeno's denial of motion (suppressed in the citation from 2, 1582 in the text above) is acknowledged and pegged on Zeno's assumption that there can be no motion unless there are instantaneous states of motion. Another assumption is imputed to Zeno in the still different analysis of the Arrow in 3, 179: "The plausibility of the argument seems to depend upon supposing that there are consecutive instants." There seem to be almost as many Zenos in Russell as there are Russells.

⁴⁰ I am deeply indebted to Professor Carl B. Boyer, of the department of mathematics of Brooklyn College, for a criticism which has prompted some revisions in the penultimate paragraph of Section II and in note 36. I am also indebted to Professor Günther Patzig for some useful suggestions.

(3) *Our Knowledge of the External World* (London, 1914).

(4) *History of Western Philosophy* (New York, 1945).

Tannery, P. *Pour l'histoire de la science hellène* (Paris, 1877).

Untersteiner, M. *Zenone: Testimonianze e frammenti* (Florence, 1963).

van der Waerden, B. L. "Zenon und die Grundlagenkrise der griechischen Mathematik," *Mathematische Annalen* 1172 (1940), 141ff. [18]

A ZENONIAN ARGUMENT AGAINST PLURALITY

THE TWO SURVIVING fragments of this argument make up between them some 65 percent of all that has come down to us of Zeno's original treatise.¹ On this one ground, if on no other, they have a high claim on the attention of anyone interested in becoming acquainted with the authentic Zeno. The problems they present are great but, one may hope, not insuperable. How much progress has already been made, one may judge by comparing the best of the recent studies, Frankel's,² with the best of the older ones, Zeller's.³ The present study picks up where Fränkel's leaves off, and this may help explain why it devotes so much more space to the discussion of his views than to those of other scholars.

I. RECONSTRUCTION OF S1

Simplicius,⁴ to whom we owe the preservation of our two fragments ("B1" and "B2," I shall call them hereafter, by their numbering in DK),⁵ makes it

From J. P. Anton and G. L. Kustas, eds., *Essays in Ancient Greek Philosophy* (S.U.N.Y. Press, 1971), pp. 119-44. Used by permission. Minor corrections have been made.

¹ This paper was presented as "research in progress" to a meeting of the SAGP (Cambridge, Mass., 1957). In subsequent years—and most particularly during 1963 and 1964—I worked intensively on Zeno's fragments and reached on some points conclusions differing from views expounded in this paper. I pointed this out to the editor of the original volume in which this was published, explaining to him that I would not have the opportunity at this time to go through this paper and bring it into line with my later conclusions. He requested its publication on these terms. Readers who may wish to compare what I say here with subsequent findings may consult my article on Zeno in the *Encyclopedia of Philosophy*, ed. Paul Edwards (New York, 1967) (**1 241ff.), where my conclusions on the interpretation of Zeno's fragments and on his place in the history of Greek thought are stated summarily. For more detailed discussions of special problems the following may be of interest: review of H. Frankel, *Wege und Formen frühgriechischen Denkens*, in *Gnomon* 31 (1959): 193ff. (**1.164ff.); "A Note on Zeno's Arrow," *Phronesis* 11 (1966): 3-18 (**1.205ff.); "Zeno's Race Course," with an Appendix on the Achilles, *JHP* 4 (1966): 95-108 (**1 189ff.). For subsequent publications on Zeno's first two arguments against plurality consult especially G.E.L. Owen, "Zeno and the Mathematicians," *PAS*, 58 (1957-58): 109-22; D. J. Furley, *Two Studies in the Greek Atomists* (Princeton, 1967), Chapter 5, on Zeno.

² H. Frankel, "Zeno of Elea's Attacks on Plurality," *AJP* 63 (1942), 1ff. and 193ff. I shall refer to this hereafter solely by the author's name. [The same paper, with few changes, has been translated in Frankel's *Wege und Formen frühgriechischen Denkens* (Munich, 1955).] For references to other studies, see Fränkel and the commentaries in H. D. P. Lee, *Zeno of Elea* (Cambridge, 1936) hereafter referred to as "Lee" and P. Albertelli, *Gli Eleati* (Bari, 1939).

³ *History of Greek Philosophy*, trans. S. F. Alleyne (London, 1881), I, pp. 614ff.

⁴ *Commentary on Aristotle's Physics* 138 3ff. To this book I shall refer solely by its author's name.

⁵ 6th ed. (Berlin, 1951).

clear that they formed parts of a longer train of argument.⁶ Of this our B1 was the concluding section, being preceded (contrary to Diels' mistaken numbering) by our B2. This in turn was preceded by another argument, which I shall call, arbitrarily, "S1." Here Simplicius (139. 18–19) tells us—and this is all he says about it—Zeno had "previously (i.e., prior to B2) demonstrated that nothing has size due to each of the many (existents) being self-identical and one." Though only a paraphrase, and an incomplete one, this is entitled to respect, for it is written by a man who has an original text⁷ not far from his eyes, having just cited from it verbatim our B2, and about to cite shortly after our B1. So taking our stand on Simplicius' paraphrase—the deduction of absence of size from self-identity and unity—we can proceed to look for the other premises which would have authorized this surprising inference. Now it so happens that we have a fragment of Melissus (B9), where absence of size is inferred from unity. I translate literally and number the sentences for convenient reference: [119]

- [M1] If it exists,⁸ it must be one;
- [M2] but if it is one, it must have no body.
- [M3] But if it had thickness, it would have parts,
- [M4] and then it would not be one.

Now by pasting the data of Simplicius' paraphrase on this fragment of Melissus, we can produce the following reconstruction of S1:

- [Z1] If anything exists, it must be one and self-identical.
- [Z2] But if it is one and self-identical, it can have no size.
- [Z3] For if it had size, it would have parts,
- [Z4] and then it would not be one and self-identical.
- [Z5] Thus, if the many exist, none of them can have size.

This is a sufficient solution to the problem of supplementing the data in Simplicius with premises that would be quite acceptable to an Eleatic yet still so plausible in themselves that assent to them could be elicited from non-Eleatics by easy supporting moves: e.g., for [Z3], "If it has any size at all, it must be also two halves of that, four quarters of it, and so forth"; and for [Z4], "If it

⁶ For the correct reconstruction of the order of its various sections, see Fränkel, pp. 17ff. The same order in Albertelli, *Gli Eleati*, p. 204.

⁷ Most probably Simplicius' book did not purport to be a complete text of Zeno's original treatise (else why only *oimai* at 99. 17, and why appeal to nothing better than the *pleistē historia* at 140. 24?). Yet Simplicius was confident that he knew at least parts of Zeno's own book. He refers to Zeno's "treatise" at 140. 28 (also at 139. 5), the same term he used for that of, e.g., Parmenides (144. 28), Anaxagoras (163. 7), and Diogenes (151. 25–28).

⁸ A variant text would yield, "If being exists . . ."

has two parts, then it is two things, hence no longer one,⁹ and then how could it be the same as itself, since it is one?"

The main hazard of the reconstruction is obviously at [Z3], [Z4], which fill in a middle term for the inference certified by Simplicius: from unity and self-identity to absence of size. Can we get some independent confirmation of this suggestion? It seems that we can, for a part of it, i.e., for Zeno's arguing, as did Melissus, from the (supposed) incompatibility of "x is one" with "x has parts" and the entailment of "x has no size" by "x has no parts": "Alexander says that the second argument, the one from dichotomy, [Arist., *Phys.*, 187a1–2], is Zeno's, who argues that if being had size and were divisible, it would be no longer one but many. . . ."¹⁰ Since "divisible" here = "has parts,"¹¹ this is good support for this part of the reconstruction. Its confirmatory value would not be appreciably reduced if, as seems probable, Alexander was echoing here not S1 as such but a part of another of Zeno's arguments against plurality.¹² There would be nothing to keep Zeno from using some of the same materials in different arguments.¹³

⁹ Cf. Plato *Meno* 77A7.

¹⁰ Simpl. 138.3–5 (included under Lee 7).

¹¹ Cf. Alexander *apud* Simpl. 127. 20–25. Cf. the transition from "having parts (*merē*)" to *memerismenon* in Plato, *Soph.* 244e–245a. Both of these passages make it clear that the "parts" and "divisions" envisaged in such arguments are *not* necessarily physical cuts and do *not* assume the necessity of intervening wedges to keep one thing apart from another in order to justify the propriety of referring to them as distinct parts of the whole or of the whole being divisible or divided in this way. As will be noticed below (Section III), there is no reference to splits or fissions in the derivation of parts, and parts of parts, at B1, and there is obviously none in the dichotomies of the Race-Course (Arist., *Phys.* IV. 2, 233a21ff., 239b14ff.).

¹² A reconstruction of it (the probable sense, not the wording) may be of interest: "If (a) there are many, then (b) each of them would have to be one, for (c) the many are a multitude of ones; but (not-b) none of them could be one, for (d) each would be divisible *ad infinitum*, hence (e) each would be infinitely many." Evidence for (a) as the refutand of several of Zeno's arguments. Plato *Tim.* 28J5–6, Simpl. 139. 5. For the form of the *reductio*: B1 *sub fin.*, B3, Plato *Parm.* 127e1–2. For "if (a), then (b), for (c)": Eudemus *apud* Simpl. 99. 7 (= Lee 6; echoed by Philoponus in *ibid.* 2 and 8; cf. also Plato *Parm.* 165e5–7, and Arist. *De gen. et cor.* I. 7, 325a9). *Henadōn* in Eudemus (and in Philoponus) can hardly be Zeno's, its first known use (and only one, even by Plato) is at *Phil.* 15a; Eudemus is clearly *not* quoting, and that part of his phrasing which suggests that Zeno argued for the nonexistence of any "one" may be dismissed as careless paraphrasing or misunderstanding, similar to that of Alexander *apud* Simpl. 127. 20–25. For "(not-b), for (d)": Themistius, *Phys.* f. 12. 1 (= Lee 1). For "(d), hence (e)", Alexander *apud* Simpl. 183. 4 but without "*ad infinitum*" at (d), and "infinitely" at (e), which Alexander may have omitted because they are logically pleonastic, though very much in Zeno's style—see below, Section VI at 2(2). The original of these last two items was clearly not in Simplicius' text, else he would not quote Themistius' paraphrase (139. 19) of the first, nor would he remark of the second, "I think there was no such argument in Zeno's text (99.17)."

¹³ Zeno must have had a fair number of arguments against plurality in his book ("40" in Proclus *In Parm.* p. 694. 23 is doubtless a padded figure, but even so a testimony to the large total with which he was credited), and, in spite of his great inventiveness, could hardly have avoided some duplication of vital premises.

II. THE ARGUMENT OF B2

As cited by Simplicius (139.10–11), the demonstrand was: "That which has neither size nor thickness nor mass, would not even exist";¹⁴ the proof ran:

[1] For if it were attached¹⁵ to another existent, it would make [the latter] no larger, [120]

[2] For, having no size, it can contribute nothing in respect of size when attached.

[3] And thus [it follows] already that what is attached would be nothing

[4] If, indeed, something will not decrease another by detachment from it, nor increase it by attachment to it, it is clear that what was attached or detached was nothing.

As is clear at [3], and also at [4], Zeno, in good Eleatic fashion, takes "would be nothing" as equivalent to "would not exist" in the demonstration. Let us give him this equivalence: we have more pressing things to worry about. What is to be proved is, "If x has no size, x is nothing." The supposed proof: "If x has no size, it can add none to y by attachment to y (= [2]), hence cannot increase y (= [1]), hence is nothing (= [3])." But this last step is astonishing. How could one possibly infer "is nothing" from "cannot increase y "? All one could infer from the latter is "Is nothing in respect of size," i.e., "has no size." But this we already know as the hypothesis at [2] and [1]. Could it then be that Zeno has confused " x has no size" with " x is nothing"? Impossible. These two propositions are, respectively equivalent to the antecedent and consequent¹⁶ in the demonstrand. Unless they were perfectly distinct in Zeno's mind, there would have been no argument. What could be happening then? Could it be trickery? Fränkel (pp. 20ff.) has so argued: the phrase at [3] which I have translated "what is attached would be nothing," τὸ προσγιγνώμενον οὐδὲν [ἐστίν], he argues, "can be taken to mean 'no increase takes place' . . . or [alternatively] 'that which is added is nothing,'" and Zeno is counting on getting the phrase with the vital, second sense past the reader's defenses by having it slip by in the innocent, first sense. Is Zeno then a slippery character, a sophist? Let us not get drawn into this argument but only ask how effective the suggested trick would really be. *Progenomenou* had been used just before,

¹⁴ Not printed as a direct quotation in DK, though both the diction and the stylistic turn of the first clause mark it off as Zeno's

¹⁵ The usual translation of *prosignesthai/apognesthai* in this fragment is "to be added/subtracted." This loses the more concrete flavor of the original, cf. Melissus B7 (4). There is good reason to think these words were never the ordinary terms for "adding/subtracting": they could not take the active voice nor supply derivatives for "addition/subtraction" to compete with *prothesis/apheiresis*.

¹⁶ "That which has no size" would be the minor term; "nothing," the major; and "that which would not increase another by attachment to it," the middle term

at [2], to mean quite unambiguously (in the usual translation) "that (existent) which is added." Why should the reader (unless he were half asleep when he read that sentence) be expected now, one sentence later, to take the very same word in the different sense of "the increase"? But suppose he did; then he would know (unless he is still nodding) that the argument has not advanced an inch ("x would not increase y" at [1]; "no increase takes place" at [3]), and Zeno's thumping claim at [3] of having "already" proved the essential point would be inane. A reader who could be fooled by such a manoeuvre would scarcely be worth fooling.

I wish to suggest another way of construing the argument. Suppose [121] we were to take "If [1], then [3]" as an enthymeme. What would be the missing premise? Obviously

[0] That which would not increase another by attachment to it, or decrease it by detachment from it, would be nothing.

Given this as the major, and [1] as the minor, [3] would follow smoothly. And if we now look at [4] above, it will be evident, I trust, that it is only verbally different from [0]. Zeno's argument then becomes formally correct if we take it as follows: "If [2], then [1]; and [1], given [4], implies [3]." What may occasion surprise is that [4] should then be left to bring up the rear, instead of heading the procession or, in any case, preceding [3].¹⁷ But this reversal of the formal order is done often enough in a conversational argument. Cf. "A and B must be equal, for they are both right angles. It is clear, I take it, that all right angles are equal." A similar reversal in Zeno's argument would incur no fault of inference, nor would it break any rules of exposition, for there were none to break at this time and for a long time after. The more serious question would be whether Zeno is entitled to [0] as a premise. Since this is clearly a dialectical argument, this question boils down to, Is [0] the sort of premise that Zeno's readers would have passed as unquestioningly true? Were it not for the conclusion of the immediately preceding S1, the answer would surely be: "Yes, no one would think of disputing [0], except one who had already formed the notion of incorporeal existence, and this could not be claimed for anyone prior to the Eleatics." But now that Zeno has just finished proving to the reader that no existent has size, it does seem awkward to expect him to admit a proposition which so obviously contradicts that conclusion. An alert reader might have balked at this point, retorting, "You are asking me to assume [0], having already implied it is false." But Zeno could have replied:

¹⁷ Other objections to this construction are (i) we would expect (*ei gar*) in lieu of *ei de* at the start of [4], but *de* can introduce a statement giving the reason for the preceding—LSJ s.v., I 3; (ii) since to *proginomenon* has been used at [3] to refer to the existent which has no size (the logical subject of [1], [2], and [3]), one would normally expect *apoginomenou*, *proginomenou* at [4] to have the same reference, but in that case the second part of [4] would be a mere reiteration, contrary to Zeno's habitual economy

You have been assuming it long before this argument began. Are you so fully persuaded now of the conclusion of S1 that you are prepared to surrender all of your previous beliefs that will not square with it? If so, I welcome you as a brother in the Eleatic faith, and there is no need of further argument with you. It is only the unconverted I am addressing now, who have not yet taken stock of the effect of the preceding argument on their familiar dogmas, [O] among them. Their innocence serves my purpose. By letting them keep [O] for the time being, I can set off another explosion whose blast effect should be still greater on their stolid minds.

Certainly Zeno would have produced a more elegant argument had he denied himself after S1 the use of any premise which clashes directly [122] with the conclusion of S1. The beauty of his other extant fragment against plurality, B3, is that it achieves just this effect. His performance here is definitely clumsier by contrast.¹⁸ But it is still a tolerable form of dialectical argument and this, I submit, is a sufficient reason for accepting this interpretation of his text in preference to either of the above alternatives, which involve, respectively, confusion and deception.

III. B1: TRANSLATION AND EXPLANATION

Translation

1. But if [the many]¹⁹ exist, each must have some size and thickness, and one [part] of each²⁰ must extend beyond the other [part of the same existent].
2. And the same reasoning applies to the projecting [part]. For this too will have size and some [part] of it will project.
3. Now to say this once is as good as saying it forever: for no such [projecting part] of it will be the last or without one [part similarly] related to the other [part].
4. Thus if there are many, they must be both small and large: so small as not to have size, so large as to be infinite.

Analytic Paraphrase

1. If [P], then [Q], and then [R].²¹
[P] There are many existents.

¹⁸ Even this could have been overcome by changing the order: instead of S1-B2-B3, he could have made it B2-B1 (lines 1-7)-S1-B1 (lines 7-9); note that S1 does not invoke any premises which directly contradict anything in B2 and B1.

¹⁹ Equally possible grammatically is "(it [sc. each of the many] exists) . . . as in Frankel, 195 and n. 72. But this makes the "each" in the next clause stylistically repetitious.

²⁰ For this construction of *autou*, partitive and referring to *hekaston*, see Frankel, n. 67. This had already been seen by W. A. Heidel in PAA, 48 (1913): 724 but has been ignored in both DK and the English translations. Correctly understood in R. Mondolfo, *L'infinito nel pensiero dei Greci* (Florence, 1934), p. 246n.1: he sees that the expression can only mean that of each existent one part *deve distare dell' altra*.

²¹ Strictly construed, the grammar of 1 would yield "If [P], then [Q and R]." But since Zeno would justify [R] by [Q], the logical sequence has to be as above.

[Q] Every existent has size.

[R] Given any existent, *a*, there will be two existents, *b* and *c*, which are nonoverlapping parts of *a*.

2. If [Q], then also [S].

[S] Given *c*, there will be two existents, *d* and *e*, nonoverlapping parts of *c*.

3. If [R] and [S], then [T]:

[T] The series *a*, *c*, *e*, *g*, . . . whose every term is related to its predecessor as *c* to *a*, has no last term.

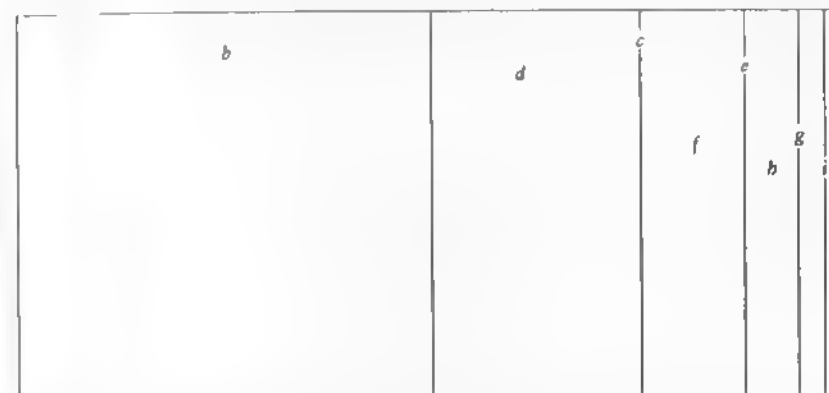
4. If [P] (and ???),²² then [U] and [not-U].

[U] The size of *a* is null.

[not-U] The size of *a* is infinite.

Commentary

There have been two broadly different constructions²³ of the reasoning in 1 to 3, pursuing alternative interpretations of *apechein* at 1, *prouchontos* and *proxei* at 2. One of them goes back to Zeller²⁴ and has enjoyed the [123] support



of excellent scholars, notably Fränkel,²⁵ who translates *apechein* "to be at a distance from" and takes the sense to be that two parts, front and back, are separated by an intervening core. In that case my [R] would have to be rewritten as

[R'] Given any existent, *a*, there will be three existents, *b*, *m*, and *c*, which are non-overlapping parts of *a*, and such that *b* is separated from *c* by *m*.

The reason for the question marks, if not already obvious, will soon become so

²² See Albertelli, *Gli Eleati*, p. 207, for the main pre-1939 references.

²³ *History of Greek Philosophy*, pp. 616-17.

²⁴ Pp. 193ff. Fränkel's construction is different from Zeller's in so many ways (beginning with the translation) that it may be misleading to think of it as a version of Zeller's theory. It is that only in respect of assuming that Zeno operates with two terms separated by a third at each step of the argument, rather than with just two contiguous terms.

Similarly my [S] would have to be rewritten as

[S'] Given c , there will be three existents, d , n , and e , nonoverlapping parts of c , such that d is separated from e by n .

My [T], on the other hand, would be unaffected: this, no more and no less, would be inferred from [R'] and [S'], as from [R] and [S]. This is my main objection to Fränkel's interpretation: Why should Zeno use more elaborate machinery to get his [T] when a simpler one would suffice? As for the wording, it is (at the least) compatible with the more economical construction, in that it refers to two parts at the first division, with no allusion to an intervening third²⁶ at 1 or thereafter: 2 (and, by implication, 3) refers only to the "projecting" part; and *proechein*, in its standard sense, "project, jut out from," is normally said of *contiguous* parts, one of which is thought of as sticking out from or extending beyond the other;²⁷ the same sense is possible, though not standard, for *apechein*, whose meaning in 1 must in any case be the same as that of *prouchontos* at 2.²⁸

Now we can see how the argument goes. That [P] implies [Q] is a carryover from B2. That [Q] implies [R] takes us back to [M3] and [Z3] in Section (1) above. One may conjecture that the reasoning would be: if something has bulk, it must be spread out in space, so you can [124] distinguish in it a "here" from a "there"; having such contiguous, noncoincident and nonoverlapping parts or regions, Zeno might have explained, is part of what we *mean* by having size. The discrimination of any two such parts in any existent I shall refer to as a "division," though no such word appears in Zeno's text²⁹ or even in my analytic paraphrase. It will be simply a convenient name for the process by which we get the two parts, b and c , at 1; d and e at 2; or any subsequent two thereafter.³⁰ That no physical cut or fission is intended here is quite obvious, and none would have been warranted anyhow, without further assumptions, since no property of existents except their size is specified at [Q]. Thus the problem, insoluble for the engineer, of pursuing the division past the smallest particle he can split with his present tools, does not arise. That no

²⁶ Or to "front" and "back" parts, assumed in Fränkel's interpretation. A projection need not be toward the front.

²⁷ Zeno's use of the term in this fragment is most probably due to his thinking of the first term in each division as being much larger than its twin. If b is much larger than c , it would be natural to think of b as the base and of c as a "projection" from it. I have ignored this point in the accompanying diagram, using the more convenient 1/1 ratio as the *principium divisionis*.

²⁸ That which is said to *apechein* at 1 is termed the *prouchontos* at 2. (And cf. *apechousin* in Arist., *De part an.*, 655a31–32.)

²⁹ Though scarcely foreign to Eleatic thought or vocabulary. Cf. *diareton* at Parmenides B8 22, *diêrêtai* at Melissus B10.

³⁰ It is thus evident that the series of divisions, D_1, D_2, D_3, \dots , matches term for term the series of "projecting" parts, c, e, g, \dots . Each is denumerably infinite, and, having a first term, can have no last.

part reached by such division will be the last follows by reiteration of the reasoning which warrants [R] and [S], or even analytically from [R] alone: a supposed last term in the a, c, e, g, \dots series would have to be an existent (since only existents are members of the series) yet not have the two parts prescribed by [R] for any existent.

IV. THE DEDUCTION OF NULLITY OF SIZE

How get past [T] to the dilemma in the conclusion? The answer must have seemed obvious to Zeno, since he gives not a word to justify, or even outline, the transit.³¹ But what would he have said, if pressed for an explanation? Let us start with the first part of the contradiction which, he thinks, he has proved to follow from the refutand: "Thus if [P] there are many, then [U] they must be . . . so small as not to have size." Is [U] supposed to follow from the preceding argument in B1? Or is it meant as the consequence of something or other *before* B1? Here are two possible justifications of [U]: "*j*" and "*j*||", let us call them. Offhand, the first might seem the better bet, for one would ordinarily expect [U] to be the direct upshot of the close-packed argument which immediately precedes it. It has been so taken by some authorities.³² How then would the derivation go? Let T. L. Heath speak for this view:³³ To prove that, if there are many, each will be so small as to have no size, Heath explains:

Zeno relied on the infinite divisibility of bodies as evident; assuming this, he easily proved that division will continually give smaller and smaller parts, there will be no limit to their diminution, and [i] if there is a final element, it must be absolutely *nothing*. Consequently, [ii] to add any number of these *nil*-elements . . . to one another, even in infinite number, will give *nothing* as the total. [125]

Had Zeno followed this line of reasoning, he would have blundered, as can be easily shown: Heath's [i] will do only as a hypothetical whose antecedent

³¹ A gap in our text is, of course, possible at this point, but there is no good reason to suppose it. That there was none in Simplicius' source is as good as certain, for, to my knowledge, he never presents a broken citation as though it were unbroken in any of his dozens of quotations from the pre-Socratics. And it is hard to see how the break could have been made by an earlier copyist or editor: why should anyone want to give the argument through [T] and then skip the links to the conclusion?

³² E.g., P. Tannery, *Pour l'histoire de la science hellène* (Paris, 1887), pp. 254–55, T. L. Heath, *History of Greek Mathematics* 1 (Oxford, 1921), p. 275; Lee, p. 30. I discuss Heath's construction as the most plausible one. For Tannery's, cf. n. 34, below. Lee's is ingenious, but would, in effect, make [not-U] a necessary premise for the deduction of [U].

³³ *loc. cit.* This is not Heath at his best. He seems to be unaware of the contradiction in the reasoning he imputes to Zeno. I suspect he was misled by Tannery (*loc. cit.*) to whom he does not refer, but whose very wording he echoes.

must be false for Zeno, since it is contrary to [T] above, and also because of the consequent of [i] is false, being contrary to [Q] above. As for Heath's [ii], it would be similarly unobjectionable if taken only as a hypothetical, *sc.* "if there were final members of zero magnitude, the aggregate magnitude of an infinity of them would indeed be zero." But what would this do to establish the demonstrandum (our [U]), that the magnitude of each of the many existents is zero? Nothing. To derive this from Heath's [i] and [ii], Zeno would have to assert the antecedent of [i]; and this he could only do by contradicting, as has just been shown, two things he has previously asserted in B1.³⁴

But what would this prove? Unless we are prepared to settle matters of historical fact by issuing unlimited credit to our philosophical heroes, we cannot regard the blunder in *j/* as a sufficient reason for thinking it could not have been Zeno's. We can, however, concede that if he did make such a mistake, it would not have been so arbitrary as it appears in Heath's reconstruction; he would not, we may assume, pursue a line of argument providing two good grounds precluding the existence of final elements of null magnitude, and then turn right around and for no reason at all assert their existence. Could there have been any such reason? To see that there could have been, we may turn to an argument in Simplicius of uncertain authorship, not included in DK but listed as a Zeno fragment by Lee and defended by him as genuine.³⁵ Since Simplicius gets it from Porphyry, I shall call it "the Porphyry text." Here is a fairly literal translation,³⁶ with reference marks interspersed:

Parmenides had another argument which was thought to prove by means of dichotomy that being is only one, and that it is without parts and indivisible.

[A] For, he says, if it is divisible, let it have been cut in two, then each part in two. This is being done continually, then clearly, he says,¹⁷

- [1] either there will be left certain final, smallest, atomic magnitudes, infinite in number, and the whole will then consist of smallest magnitudes, infinite in number;
- [2] or else it will vanish and be dissolved into nothing and will then consist of nothing

These conclusions are absurd. Hence it cannot be divided, but will remain one.

³⁴ Tannery's construction (*loc. cit.*) leaves Zeno free from this fallacy, but only by shifting on Zeno's "adversary" the burden of asserting that there are final elements. But if that is the way the "adversary" is going to behave, how did he get past our [T], or even to it, was he so careless as to agree to [R]?

³⁵ The second in his Zeno fragments. For the defense, see his commentary. Albertelli (*Gli Eleati*, p. 185) cites it along with Philoponus 80. 23ff (= Lee 3) as examples of "fanciful and partly arbitrary reconstructions of Zenonian reasoning" by later writers.

³⁶ Partly indebted to Lee's.

¹⁷ In Lee the words *κάπεται τῶν μερῶν ἑκάτερον δίχα, καὶ τούτου ἀεὶ γενομένου, δηλὸν φησιν* are omitted without explanation.

[B] Further, since it is all alike throughout, if it is divisible, it will be divisible throughout (*pantēi*)³⁸ alike, not just here but not there (*τῇ μὲν, τῇ δὲ οὐ*).³⁹ It will be clear that, once again, nothing will [126] remain, but it will vanish, and, if it is to have components, it will consist of nothing. For if any part of it is left over, it has not yet been divided throughout. From all this, he says, it is evident that being will be indivisible, without parts, and one.

Conspicuously absent from this argument is any mention of *infinite* divisibility. But that the assumption is made at [A2] and [B] is certain.⁴⁰ For since [A] is the case in which the division is finally stopped by "atomic magnitudes," [A2] must be the remaining alternative: no atomic magnitudes, hence infinite divisibility. The same, *a fortiori*, at [B], for this takes up where [A2] leaves off, adding nothing except the stipulation that being is "divisible throughout," thereby closing off the [A1] possibility left open before. How then does the writer get to the conclusions of [A2] and [B]? His key moves are the opening ones: "let it have been dichotomized" at [A]; "let it have been divided throughout" at [B]. In other words: suppose that the operations which are said to be possible in the hypotheses ("divisible"; "divisible throughout") have been carried through to a finish, or completed. The conclusion which interests us then appears as a necessary condition of this completion: so long as any part of being is left undivided, the division of being has not been completed; it can have been completed only when being has wholly "vanished." But what makes the writer so sure that his key moves are authorized? To put in the most blatant form the assumption he is making, let us have him reply:

Suppose the hypothesis had been instead, "x is mechanically divisible." I would then be obviously authorized to assume that it is logically possible to carry out completely the mechanical division of x. By the same token, from "x is infinitely divisible," I am entitled to infer that, on this hypothesis, the completion of the infinite division of x is logically possible.

What is being assumed here is that the *logical* (no less than the grammatical) relation of "infinitely" to "divisible" is parallel to that which ordinary adverbs like "mechanically," "smoothly," "cheaply," etc., might bear to "divisible." The assumption is, of course, mistaken, for it leads to a contradiction: Since

³⁸ *Pantēi* also in Aristotle, *De gen. et cor.* 1. 2, 316a16ff. and 325a8, and only in these two passages in Aristotle with this meaning, to my knowledge.

³⁹ *Tēi men, tēi de* in Arist., *De gen. et cor.* 1. 8, 325a10 as the contradictory to *pantēi*.

⁴⁰ At [A1] also for nothing less than an infinite number of divisions is required to produce an infinite number of these atoms from a single original thing; but that "final" terms do result would also entail that the series of divisions is *not* infinite. This is a muddle, the worst I have encountered in this inquiry.

"infinitely" = "endlessly"⁴¹ and "completion" = "ending,"⁴² it follows that "the completion of the infinite division of x is logically possible" = "the ending of the endless division of x is logically possible." But this brings into the open the contradiction that remains concealed even when the assumption is put in the ultra-explicit form of the imaginary argument above, for even there it is far from obvious that the relation of "completion" to [127] "infinitely" is the same as that of "ending" to "endlessly." How much more plausible the whole argument would be when this assumption itself is masked by excluding "infinitely" from a place in the explicit premises, as the whole argument of the Porphyry text succeeds in doing. The extent of its plausibility we may judge from the fact that the core of [B] is reproduced point for point in an argument which Aristotle cites⁴³ as the very one which was "believed to necessitate atomic magnitudes";⁴⁴ and Aristotle talks⁴⁵ as though it was so believed by Democritus. Zeno too then *could* have subscribed to the same reasoning; and having reached by this route the conclusion that infinite divisibility entails dissolution into final elements of null magnitude, he could have carried the results over into B1 and could then easily have taken *j*l, contradiction and all, in his stride. All this, *if* the argument in the Porphyry text is really his. But is it?

Citing it from Porphyry, where, as we saw, it is ascribed to Parmenides, Simplicius remarks: "It is worth considering whether this argument is really

⁴¹ In a sense which has nothing to do with *temporal* endlessness but is simply the logical endlessness of a series of divisions (n. 30. above) which can have no last term, since it is infinite, denumerable, and has a first.

⁴² In the same sense, i.e., reaching the final terms of the series of terms produced by the series of divisions. [A1] speaks openly of "final" terms; [A2] and [B] imply the same thing, since their "nothings" are not regarded as existing *outside* the series (in which case their existence would be logically harmless) but as members of the series, hence necessarily its last members.

⁴³ *De gen. et cor.*, I 2, 316a15ff.; cf. n. 38, above. The main difference is "body" here in place of "being" in the Porphyry text, and a far more verbose and explicit argument, whose goal is to establish pluralistic atomism, not (as in Porphyry) Eleatic monism. But the structure of the two arguments is the same. This one runs, if a body is "divisible throughout," its complete division is logically possible but cannot be complete so long as any part remains undivided; hence, when the division has been completed, the body will have been dissolved into extensionless points or bare "nothings" (316a28). For a better comprehension of this argument, the sense of the difficult line 316a20 should be taken to be just that indicated at n. 38, above: bisect (divide *kata to meson*) similarly (*hōsautōs*, *a* to get *b* and *c*, then *b* and *c* to get *d* and *e*, and *f* and *g*, respectively, and so forth) and completely (*kai holōs de*, i.e., until no part is left undivided; Joachim's rendering [the Oxford translation, followed also in the Loeb] "by any other method," is very strained and in any case unnecessary, since a simple translation makes good sense).

⁴⁴ *De gen. et cor.*, I 2, 316b35.

⁴⁵ Without actually saying so. Cf. *De gen. et cor.*, I 2, 316a14; cf. H. Cherniss, *Aristotle's Criticism of Presocratic Philosophy* (Baltimore, 1935), p. 113, but note also the striking similarities with *De gen. et cor.* 325a8-10, noticed at nn. 38 and 39, above, and further that the inference from infinite divisibility to the dissolution of existents into nonexistents is endorsed by Epicurus, *Ep. ad Hdt.* 56, and seems to be echoed also by Lucretius, I. 746-56.

Parmenides', and not, as Alexander thinks, Zeno's" (140.23). For opposing the Parmenidean authorship, Simplicius gives an excellent reason: "No such argument figures among the Parmenidean [texts]."⁴⁶ But when suggesting its derivation from Zeno, all he can offer in support is "that most of our information refers the puzzles from dichotomy to Zeno."⁴⁷ This is meager evidence indeed: the cited statement is consistent with the existence of several original "arguments from dichotomy" by early writers other than Zeno, and for any number of later pastiches. Did Alexander then have a better reason? Not likely, else Simplicius would have mentioned it to strengthen his case. And there is internal evidence against its ascription to Zeno: (1) it argues constructively for the Eleatic thesis that Being is one and indivisible, after the manner of Parmenides and Melissus, not destructively against the non-Eleatic thesis that "there are many," which is the only thing Zeno did when arguing on plurality according to both our primary⁴⁸ and secondary⁴⁹ evidence; (2) the form of the arguments is quite different from that of Zeno's extant arguments against plurality, both of which fall very self-consciously into the "If P , then C and not- C " pattern, the predicates in C and not- C being carefully phrased to heighten the felt contrast: so small as to be null *and* so large as to be infinite at B1: finite (in number) and infinite (in number) at B3. In the Porphyry text this pattern is altogether absent at [B], while [A] offers *alternatives* at [1] and [2] ("either . . . or . . ."), not a *conjunction* ("both . . . and . . ."), and makes no effort to exploit the contrast by finding at [2] pat antitheses to [128] the predicates at [1]. With the materials of [A], Zeno would surely have produced a razor-sharp " C and not- C " conclusion from the hypothesis, or even a couple of them: finite in size *and* null in size; infinite in number *and* null in number. Nor would it have been like him to bluster at [1], saying its conclusion is "absurd," instead of parading its absurdity. What is it, anyhow? None is now visible to the naked eye.

So the case against the ascription of the Porphyry text to Zeno is strong, while that for it could hardly be weaker.⁵⁰ But this text has at least shown us

⁴⁶ For "texts," not "traditions" (so Lee, p. 22), to be supplied after *tois parmenideiois*, cf. Simplicius 116 6 and 19, also 144 28.

⁴⁷ Lee (p. 31) thinks "Simplicius clinches his argument [for the Zenonian authorship of the Porphyry text] by quoting this argument [B3] from Zeno's own book as being sufficiently similar to the argument in question [that of the Porphyry text] to justify him attributing it to Zeno." But the subject of *phēretai* at 140 27 is the same as that of *apomnēmoneuetai* just before, which can only be the *ek tēs dichotomias aporia*, not the Porphyry text as such.

⁴⁸ B1, B3.

⁴⁹ Plato, *Parm.* 127e ff.; Simplicius 139 5ff., 141 10.

⁵⁰ Its authorship must remain unknown, though we may surely list Melissus as an important source for [B]. He too argued formally for the same demonstrandum (cf. his B9 and B10), and made explicit use (at his B7) of the Parmenidean premise that being is "all alike," from which the key proposition is derived at the start of [B] that being must be "divisible throughout" and not just here, but not there—both of these expressions occur, as we have seen (nn. 38 and 39, above).

the only plausible route by which Zeno too would have inferred final elements of null magnitude from infinite divisibility, if he had ever done so: by way of the assumption that "is infinitely divisible" entails "Its complete division is logically possible." Let us then scan his other fragments to see if he shows any tendency to take this path in any of them. He certainly does not in the Race-Course and Achilles, both of which proceed on precisely the opposite assumption: that their respective series, being infinite, cannot be traversed. Nor does he in B3: the number of existents, Zeno argues here, must be infinite "because there are always other (existents) between any (given) existents, and again others between these." Here too the argument would have been ruined if Zeno thought that this infinite process *could* be completed. So far, then, as we can judge from his other work, Zeno did not make the assumption that would have led to [U] via *jI*.

We could, therefore, rule against *jI* by merely availing ourselves of a principle of exegesis analogous to the "innocent if not proved guilty" rule of the common law: given two constructions of a text, both of them equally consistent with the evidence, prefer the one more favorable to the author's intelligence. Such *jII* would certainly be: it would suppose Zeno to be inferring that *a* is "so small as to have no magnitude" from the conclusion of S1 that *a* has no magnitude. The inference is harmless to the point of triviality, and Fränkel's suspicion of "precarious" logic here—"Smallness, i.e., little magnitude, can hardly be ascribed to a thing which actually possesses none" ("Zeno of Elea's Attacks," p. 200)—seems unfounded: one could indeed object to an inference like "*a* has no size, therefore it has a very small size," since "very small size" does suggest some finite size, all the more so in the context of B1, where "some size" at 1 and "size" at 2 are used to mean a finite size. But I can see no good reason to object to "*a* has no size, therefore *a* is so small as to have no size," for "no size" in the consequent quite clearly precludes the reservation of a finite size. So logically *jII* is as impeccable⁵¹ as *jI* was disreputable and has a sterling claim to the benefit of the doubt. What is more, it has some slight [129] positive evidence in its favor: Simplicius writes as though he believed *jII*. With both [U] and [not-U] clearly before him—he starts off by citing it at 139. 8–9—he refers to B1 (by citation, 141. 1ff.) only as providing proof of [not-U], infinity of size;⁵² and since he does not tell us

at *De gen. et cor.* I. 8, 325a3–13, which seems to be principally a report of Melissian doctrine (the initial argument, "no motion, if no vacuum," is properly his [B7 (7–10)]), and the next one, "no plurality if no vacuum" is most likely to be his, since he is the only Eleatic known to have used the nonexistence of a vacuum as an explicit dialectical premise)

⁵¹ There might still be the objection that "so small as to have no size" is linguistically idiosyncratic. But Zeno does want a special effect here: to make the contrast with "so large as to be infinite" at [not-U] as loud as possible. Is it too loud? Not for his purpose; he wants to startle.

⁵² The strength of this link in the argument would be doubled by Fränkel's (p. 17) brilliant emendation of *apeiron* for *apeirôn* of the MSS at Simplicius 139. 15. For then Simplicius'

how [U] is proved, but does refer (by paraphrase, 139. 18–19) to the proof of nullity of size at S1, it seems reasonable to assume that he thinks this *was* the proof of the first horn. To be sure, it remains possible that he misunderstood Zeno's argument. But had he done so, it is more likely that he would have misunderstood it in the direction of *jI* (since, as we have seen, he is willing to credit Zeno with the text from Porphyry, and hence to believe that Zeno did deduce null size from infinite divisibility). And since his knowledge of the text was better than ours, his apparent interpretation of it in the direction of *jII* may be allowed to decide in its favor.

V. THE DEDUCTION OF INFINITY OF SIZE

Having exonerated Zeno from a fallacy in the deduction of [U], it would be pleasant if we could render him the same service in the deduction of [not-U]. This unfortunately is out of the question. That *a* is "so large as to be infinite" could have been derived, so far as I can see, from nothing but the immediately preceding argument, and only by intercalating the certainly false premise that the sum of every infinite set whose every member has finite size must be infinitely large.⁵³ Only one proposal to save Zeno from this error is even worth discussing: Fränkel's, to the effect that *apeira* could mean here "indeterminate" no less than "infinite," and Zeno was exploiting the *double entendre* to make "the conclusion sound far stronger than it really is" (p. 197). But I find this third allegation of slippery logic no stronger than the ones I rejected above. This one can be disposed of on purely linguistic grounds: we do not know of a single case in which *apeiron* means "indeterminate in respect of size (or, of number)." When it does mean "indeterminate," as in a fragment of Philolaus (B11) or in Plato's *Philebus* (23c9ff.), it expresses simply lack of form or definiteness in general. Neither in these cases, nor in any other classical text known to me,⁵⁴ is *apeiron* used as modifier of size or number to mean "large or small or medium, we don't (or, can't) know which." What we do find is, in poetic or popular usage, *apeiron* for "indeterminately large," i.e., "vast, enormous."⁵⁵ And this, of course, would not save Fränkel's thesis, for even if we supposed it (as Fränkel does not) to be the meaning of *apeira* here,

epitome at B1 at 139. 17–18 would be attached directly to [not-U], instead of merely, as on the present reading to [Q]. But I am not sure the emendation is correct: the style of *apeiron* etc. seems a little too spry for Simplicius.

⁵³ Also, of course, the unobjectionable premise that the magnitude of *a* equals the sum of the series $b + d + f + h + \dots$ (cf. the diagram at III, above).

⁵⁴ Fränkel (*loc. cit.*, n. 52) also refers to Aristotle's use of *apeiron* at *Phys.* III, 6, to refer to a convergent series. But here *apeiron* is predicated of the series (not of its sum, as it would have to be in our fragment) and does mean "infinite."

⁵⁵ Good example in LSJ s.v. B.1

it would convey an inference as fallacious as if it did mean "infinite": to infer that the sum [130] of the $b + d + f + \dots$ series is enormously large would be as bad a mistake (indeed, a worse, more whimsical, one) as to infer that it is infinitely large.

There is then no escaping the sense of "infinite" for *apeira*, and we must, therefore, reconcile ourselves to the thought that our clever Zeno here walked into a booby trap. How are we to explain the mishap? The simplest explanation would be that it was due simply to his ignorance of the arithmetical theorem (whose first preserved statement is in Aristotle),⁵⁶ that the sum of a series will not exhaust a finite quantity, no matter how far the series may be extended, if its terms decrease in constant ratio.⁵⁷ I do not find this a convincing explanation. Zeno's arithmetic, properly used, would surely have taught him all he needed to know in order to explode his fallacy by this method. Thus, if he made $3/4$ the ratio of division, he could have seen that when the series had just two terms, b and d , the sum would be $3a/4 + 3a/16 = 15a/16$; when it had three terms, b , d , and f , the sum would be $63a/64$; and that the same thing would happen no matter how many terms he put into his series, the sum being always less than a , since the last term added would never be the whole of the difference between a and the sum of the preceding terms but always $1/2$ of that difference. Naturally, there is no means of proving, and no particular reason for assuming, that Zeno did any such figuring. Let us suppose him averse to such calculations or even incapable of them. He could still have satisfied himself on the essential point by simply reasoning as follows: "Since all the magnitudes included in the series are nonoverlapping parts of a , their sum will always fall short of the magnitude of a by just that part of a which remains as yet *unincluded* in the series—as some part always must, since the series is infinite." There is nothing especially recondite about this reasoning, and the gist of it would be intuitively apparent in the simplest of diagrams, such as the one at Section III, above: if Zeno used a two-dimensional figure to represent a , and moved in division from left to right, it would be perfectly clear that his procedure would never allow him to get past the right-hand extremity of a , or, indeed, to ever get to a .

Conversely, we would do well to remind ourselves that knowledge of the Aristotelian theorem did not offer sufficient protection against Zeno's fallacy. Thus Simplicius, who expounds Aristotle's formula quite intelligently in commenting on *Physics* 206b3, solemnly asserts in other contexts that "that [whole] which consists of infinitely many magnitudes would have infinite

⁵⁶ *Phys.* 3. 6, 206b7–9. For the best translation and explanation, see T. L. Heath, *Mathematics in Aristotle* (Oxford, 1949), p. 106.

⁵⁷ There is, of course, nothing in the premises of Zeno's argument to require (a) that the $b + d + f + \dots$ series decrease in constant ratio, or (b) that the assumed magnitude of a be finite. But both (a) and (b) are *consistent* with the premises, so that if their addition sufficed to defeat the conclusion (as it does), the dialectical force of the whole argument would be ruined.

magnitude."⁵⁸ Or, to keep closer to the classical era, we have the same idea in Epicurus: [131]

Neither must we allow that [bodies] of finite size may decrease *ad infinitum*. For once one says that there are an infinite number of bodies, of no matter what size, in a given thing, it becomes impossible to understand how the size of the latter could still be finite. For [each of] the infinitely many bodies has some size; no matter what may be this size, their [aggregate] size would then be infinite.⁵⁹

There must have been some tacit assumption which would have made it seem obviously true that any collection of an infinite number of sizeable parts would have to be infinitely large: so very obviously, that even someone who knew all about Aristotle's theorem (as Simplicius certainly did, and some of Epicurus' associates almost as certainly)⁶⁰ would not think of applying it to the present case, but infer forthwith infinity of size for the container from infinity of number of the parts contained. I cannot imagine what this could be except that *the collection had a smallest member*. This would be quite sufficient to make the conclusion seem a matter of course: given an infinity of nonoverlapping parts the least of which has some finite magnitude, it would be obvious that the aggregate magnitude would be infinite. "But would not this contradict [T] above?" Certainly, since "smallest" entails "last." But the contradiction need not have been apparent even if carried to the closest proximity with [T]. It could even be imported into the explication of [T] and still not strike the eye, as, e.g., in "all the members of this series, *down to the very smallest*, must have some finite size." And if the italicized phrase aroused misgivings, they could be suppressed with "the members of the series are arranged in order of decreasing size, so there must be a part smaller than any part,⁶¹ and this could only be the smallest." The plausibility of this assumption seems to me very great. It expresses the tendency to extrapolate from what remains true of the series so long as it has a finite number of terms to what would be the case if *all* its terms were present in it. Zeno's best hope of checking this tendency lay in making the assumption as explicit as possible. Had he actually said, "The series $b + d + e + \dots$ must have a last member," his chances of noticing the contradiction with [T] would have immeasurably

⁵⁸ *Phys.* 142 14, cf. also 168 34–169.1, 459 23–24, 460 2–4, 462 3–5, *De caelo* 608 15. From *ibid.* 459.25–26 it would appear that Eudemus held the same view. Eudemus, needless to say, is a competent historian of mathematics, and so perhaps is Simplicius himself (cf. pp. 60 to 69 of his *Physics*).

⁵⁹ *Ep. ad Hdt.*, 56–57. For some comment, see my "Minimal Parts in Epicurus," *ISIS* 56 (1965) 121–47, at p. 141 and notes (**2.307–8 and nn.).

⁶⁰ Cf. the paper cited in the preceding note, p. 127 and nn. (**2 291–92 and nn.).

⁶¹ Which would even be true if taken to mean, "given any part, there is always a smaller." In spite of verbal appearances, the two statements would be *contraries*. Cf. Bertrand Russell, *Our Knowledge of the External World*, rev. ed. (London, 1926), pp. 141–42.

improved. He threw this chance away when he treated the inference as something much too obvious to deserve a place in his text.

Lacking support in textual evidence,⁶² the suggestion I have made is merely a hypothesis as to why Zeno made the fallacy in the deduction of [not-U]. But that he did make the fallacy is no hypothesis. It is as much of a certainty as any we can hope to reach in such matters. Since there is no trace of a similar error before Zeno's time, he must be [132] reckoned the inventor of this fallacy. And since his arguments had a considerable currency, he must also be reckoned its most important propagator. It may thus have been his influence that reached down to the end of the fourth century to provide Epicurus with a bad reason for atomism.⁶³ It was certainly at work in the middle of that century, for Zeno is mentioned as the source of arguments which led Xenocrates to that metaphysical and mathematical oddity, the doctrine of indivisible lines.⁶⁴ It is a reasonable presumption, though of this we have no direct evidence, that he also exercised some influence on the founder of the atomic hypothesis, his contemporary, Leucippus.⁶⁵

But on another of his great contemporaries, Anaxagoras, Zeno's arguments fell flat. Anaxagoras' knowledge of Zeno's book may now be more than a general presumption, for some close echoes of Zenonian diction have been recently noticed in two of his fragments.⁶⁶ Acquainted with Zeno's arguments, yet making infinite divisibility a cardinal principle of his physics, Anaxagoras must have certainly rejected Zeno's fallacious inference from it in B1. This is perfectly plain from the very form in which he states his adherence to the principle of infinite divisibility:⁶⁷

⁶² But cf. n. 68, below.

⁶³ I suspect that the equally fallacious argument at Lucr. 1. 615-22 also comes from Zeno: its affinity to his B3 is obvious, and it can be recast into the same, "If *P*, then *C* and not-*C*" form.—If any part, *a*, of the universe, *u*, is infinitely divisible, then the number of parts in *a* and *u* is equal (since infinite in both) and unequal (since *u* has all the parts of *a* and also all the parts of parts other than *a*).

⁶⁴ Ps.-Arist., *De lineis insec.* 968a18ff., 969a26ff., 969b16ff. All these references are to the Race-Course. But 968a3-7 looks like a reference to our B1, though without ascription to Zeno. Cf. also Philoponus, *Phys.* 84.15ff. The testimony of Alexander *apud* Simplicius 138.10ff., and of Simplicius himself, 140.13ff. and 142.16ff., is not so clear.

⁶⁵ Cf. Aristotle, *Phys.* I. 3, 187a2-3.

⁶⁶ J. E. Raven, "The Basis of Anaxagoras' Cosmology," *CQ* 48 (1954) at 126-28.

⁶⁷ We are fortunate in having these original fragments, for from Simplicius (461.7-9) and from *De caelo* 608.15 one might have gathered that Anaxagoras did make the same fallacy. But note that Simplicius does not profess to be paraphrasing at this point but only to be drawing an inference (*sunnoein*) from the foregoing. He assumes that the inference he would draw (sc. that everything is infinitely large; n. 58, above) from the premise that everything has an infinite number of parts would also be drawn by Anaxagoras. The only thing in Anaxagoras' fragments that might lend color to this imputation is the last sentence of B3, and it is significant that Simplicius did *not* cite it in support of his interpretation. I would translate, "In relation to itself each thing is both great and small" and would interpret: when we take a thing just by itself, the determinations "large" or "small" become matters of indifference; a grain of sand is small only by comparison, say, to a stone, taken by itself there is no more reason for calling it small than large.

B3 For of the small *there is no smallest*, but always a smaller, for it is impossible that what is should not be . . .

B6 . . . Since the *smallest cannot exist* . . .

In the italicized words Anaxagoras explicitly repudiates that assumption which, if I am right, was just the source of Zeno's fallacy.⁶⁸

VI. SOME CONCLUSIONS

1. Of "Pythagorean" Point-Atoms, No Sign

It has been held by scholars of the highest eminence, and is still widely believed today, that Zeno's polemic was specially directed against a theory, supposedly held by the Pythagoreans of his time, that the ultimate components of the universe had the indivisibility of geometrical points and the extensive magnitude of physical bodies.⁶⁹ Elsewhere I have questioned the existence of trustworthy evidence that the Pythagoreans entertained any such theory at this time.⁷⁰ Here we may consider Zeno's side of this supposed polemic. From the foregoing analysis of one of his arguments against plurality, what may we learn of its target? The refutand of the whole argument is "many exist," and what it professes to show, if true, would be true of any existents: none have size, and all have infinite size. The premises used in the deduction are, in the first case, the self-identity and unity of any existent, which no one would have [133] denied; in the second, the capacity to increase other things when attached to them, to decrease them when detached from them, which all non-Eleatics would impute to all existents. The scope of the argument then is perfectly general: all being, real or supposed, is its theme. Where then are the famous point-atoms? There is no mention of them or allusion to them in the fragments we have studied, and not once have we found it necessary to bring them into the elucidation of the sense of Zeno's words.

But Aristotle, in a reference to B2, writes as follows:⁷¹

* That Anaxagoras should be so emphatic on this point (note that "no smallest" at B3 is strictly unnecessary, the sentence might as well have read simply "of the small there is always a smaller" as the next one does read "and of the large there is always a larger") could mean that he thought this was the source of Zeno's fallacy.

⁶⁹ The best statement of the theory is still that of its originator, Paul Tannery (above, n. 32, chapter on Zeno). For influential adherents Burnet, *Early Greek Philosophy*, 3rd ed. (London, 1920), pp. 310ff.; Cornford, *Plato and Parmenides* (London, 1939), pp. 58ff.; H. Cherniss (above, n. 45), p. 43 and pp. 155-61; Raven (above, n. 66), p. 126, speaks of this view, with some reason, as now "generally accepted." But *contra*, e.g., G. Calogero, *Studi sull'eleatismo* (Rome, 1932), pp. 115ff.; N. B. Booth, "Were Zeno's Arguments Directed against the Pythagoreans?" *Phronesis* 2 (1957), 95ff.

⁷⁰ (Review of J. E. Raven, *Pythagoreans and Eleatics*) *Gnomon*, 25 (1953), 31-32 (*1.182-84).

⁷¹ *Met.* 1001b7-19. I have made liberal use of the Oxford translation.

Further, (i) if unity itself were indivisible, then, according to Zeno's postulate, it would be nothing. (ii) For, he says, that which makes [something else] no larger, when added, and no smaller, when subtracted, is not an existent, (iii) evidently assuming that being is magnitude. (iv) And, if a magnitude, it must be corporeal, for this [has magnitude] in all dimensions,⁷² while other [magnitudes], do make [other things] larger when added in one way but not in another: e.g., a plane [may increase a plane] and a line [may increase a line], but (v) a point and a unit [can increase anything] in no way whatever. (vi) But though his theory is of a low order, and the possibility of an indivisible thing can be justified even to him⁷³—for such a thing [*sc.* a point] when added *would* increase the number, though not the size—still, how can a magnitude arise from one, or any number, of such [indivisible] things? This would be like saying a line could arise from points

Now if we did not have the original fragment, we would find it difficult to sort out reportage from inference in this whole passage and could then have good excuse for invoking Aristotle's witness for talk of the indivisible point-unit in Zeno's argument. Yet even then an attentive reading might have made out the difference between (ii), which is clearly credited to Zeno ("he says"),⁷⁴ and everything after it, since already at (iii) Aristotle is telling us what is implied⁷⁵ by the Zenonian doctrine at (ii) without saying that this implication was mentioned by Zeno himself; while at (iv) and (v) we are at a still further remove from the paraphrase at (ii), for these are only implications of (ii).⁷⁶ Yet it is just this "instructive passage" which Burnet thinks *proves* that Zeno's first argument against plurality "refers to points."⁷⁷ Ross too cites (v) in this passage as one item of evidence for the view that "what Zeno is attacking is the building up of the world out of points and units";⁷⁸ his other item is Simplicius, 99. 10, "(vii) But here, as Eudemus says, he [Zeno] refuted the One—for he speaks of the point as the One." But this is unintelligible apart from the context, where the "here" refers to the long extract from Eudemus

⁷² I am adopting Frankel's (p. 18) deletion of *on* at line 11. Without the deletion the sense would still be pretty much the same.

⁷³ I.e., even if we were to assume that what Zeno says at (ii) is true.

⁷⁴ A perfectly adequate paraphrase of the closing part—[4] at (II), above—of our B2. The substitution of "added/subtracted" for "attached/detached" in the original (cf. n. 15, above) is scarcely culpable in this context.

⁷⁵ *hōs délonhoti*. For other uses of this expression to mark a constructive inference, see *Phys.* I. 4. 189b10, *De caelo* I. 10, 279b28.

⁷⁶ Similarly at (i) Zeno is not represented as having *said* that unity, if indivisible, would be nothing, or even that what is indivisible would be nothing. "Zeno's *axioma*" is clearly what Zeno *assumed*, i.e., (ii): cf. Cherniss' excellent paraphrase, (above, n. 45), p. 43 n. 165. As for "theory" at (vi), it refers to (ii) + (iii) + (iv) + (v), i.e., to what Zeno "says" and what follows from it.

⁷⁷ *Early Greek Philosophy*, p. 317.

⁷⁸ *Commentary on the Metaphysics* I (Oxford, 1924), p. 246. But Ross does not explain why he thinks this is the case. Shortly before (p. 245) he appears to be recognizing that (ii) is all that Aristotle ascribes directly to Zeno.

that Simplicius (97.11–99.6) has just finished quoting. The [134] relevant lines are, "(viii) but the point he [Zeno] assumed was nothing."⁷⁹ [xi] For he held that what does not increase [another thing] when added nor decrease (it) when subtracted, is not an existent" (97.15–16). Here it is quite clear that not even Eudemus claims to be reporting any *statement* of Zeno's about the point: this Zeno "assumed" (*tithēnai*), he says, i.e., must have thought so, since he held (ix). Thus the point-unit, which made its first appearance in our texts in Aristotle's argument at (iv) above, continues to accompany the paraphrase of B2, though still without any claim that Zeno said this or anything else about the point. It is only at (vii) that this distinction rubs off at last, and the explanation, "for he speaks of the point as the One," reads as though Eudemus said that Zeno said that the point is "the One." But since we have the original of Eudemus's statement, we can see that not even he said that Zeno said any such thing.⁸⁰

2. *Dialectical Histrionics*

If I had to judge Zeno's character on no other evidence than that supplied by his performance in this argument against plurality, my verdict would be: (1) He is not an impostor, even in play: three distinct imputations of sophistry have been examined, and not one of them, I have argued, is sustained by the evidence.⁸¹ (2) But he is very much of a showman.⁸² His theatrical taste is written all over its design. When he reached the end of B2, he had already proved to his satisfaction that, if the many exist, they cannot have size, and that they must have size. This of itself, if valid, would be an ample refutation of the pluralist thesis; hence everything thereafter would be logically super-numerary. But for Zeno this sequel is the climax of the whole argument, contriving the far more spectacular contradiction "so small as to have no size, so large as to be infinite." Had he been less intent on getting this melodramatic

Even if *mēde hen* were the correct text here (so Diels; but *mēden* or *mēthen* in the same quotation, Simplicius 139 I), the sense would still be "nothing" ("not even one").

⁷⁹ But even if Eudemus were professing to be giving us at (viii) information of what Zeno said, the *point* would be of dubious value, since Eudemus seems to be following not Zeno's text but Aristotle's paraphrase: his reference to "point" at (viii) and his shift to *prostithemenon*, *aphaimenon* and use of [*ou*] *tōn ontōn einai* at (ix) reveal his direct dependence on the Aristotelian passage.

⁸⁰ I.e., that of the fragments. As for the secondary evidence, the best of it, Plato's, is ambiguous at *Parm.* 128a–b. Plato puts the gravity of Zeno's argument on a level with that of Parmenides himself; at *Phaedr.* 261d ff. he associates Zeno with the orator who makes the same things take on contrary appearances, and thus seems to think of him as an artificer of deception, whence Cornford *Plato and Parmenides*, pp. 67–68, infers that "Plato seems to have thought of him as a mere sophist." But note that Plato does not impute to Zeno *intentional* deception or deliberately *sophistical* arguments, and that in calling him the "Eleatic Parmenides" Plato associates him with inventors (cf. *Rep.* 522d, *Laws* 677d), not charlatans. The reference to Zeno as a professional sophist (taking fees) is only in *I Alc.* (119a).

⁸² Here I meet Frankel (pp. 193, 206) halfway.

finale, he would have been spared the local gaffe by which he got it. The mistake was avoidable, since Anaxagoras avoided it without benefit of any intervening improvement in logical or mathematical apparatus.

3. Advance in Logical Technique

But Zeno's argument, for all its faults, marks a great advance in philosophical argumentation, as one can see by comparing it with the only important previous venture in this medium, Parmenides. One part of Zeno's argument, the first six lines of B1, is a brilliant piece of logical exposition, incomparably more precise, rigorous, and economical than any surviving fragment of earlier philosophical prose. The architectonics [135] of the whole argument are also impressive. Three distinct inferential sequences are joined to form a unified argument, exhibiting, probably for the first time in a philosophical context, the *reductio* in its most powerful form, "If *P*, then *C* and not-*C*. [Therefore, not-*P*],"⁸³

4. A Substantive Contribution

But Zeno reveals more than technical talent in this argument. In its opening part he throws out an idea new to Western philosophy: the incorporeality of Being.⁸⁴ It is easy to miss its significance,⁸⁵ since he exploits it only for dialectical purposes. How great its value will be apparent if one notes that in this area the vision of the great Parmenides remained blurred and indistinct; and that without this needed clarification the whole of that great metaphysical construction hovers uncertainly on the edge of confusion.⁸⁶

⁸³ The *reductio* is, of course, also Parmenides' standby; but he does not cast his arguments in the form which would exhibit the fatal consequences of the refutand as a pair of contradictory propositions.

⁸⁴ On the above reconstruction of S1, "no existent has size" would be true for Zeno, since it follows from [Z1], [Z3], and [Z4], not one of which he would have reason to doubt. This conclusion gets some added support from the fact that it would preserve consistency with the pattern of argumentation suggested at *Phaedr.* 261d7–8, which may be expanded and rephrased in the light of *Parm.* 127e1–2 as, "If there are many, then each would be both homogeneous and heterogeneous, both one and many, both at rest and in motion." It will be noticed that the first term in each of the contradictory pairs "homogeneous" (*homoia*; cf. *Parm.* B8.22 and *Mel.* B7.1), "one," "at rest"—would be a true predicate of Eleatic Being. So would the first term of the corresponding pair—"no size and infinite size"—in the present argument.

⁸⁵ I too have missed this prior to the present study: I ascribed the innovation to Melissus [(Review of J. E. Raven, *Pythagoreans and Eleatics*) *Gnomon*, 25 (1953): 34–35 (**1.186–87)]. Since Zeno's book was written in his youth (*Parm.* 128d), it is reasonable to assume that it preceded any writings by Melissus.

⁸⁶ I cannot attempt to defend here my view that the incorporeality of Being is entailed by Parmenidean doctrine but is not asserted by Parmenides, probably because he himself did not clearly see the entailment.

ZENO OF ELEA

IN THE *PARMENIDES* (127a–128e), Plato represents Zeno as being "close to forty" when Parmenides was 65 and when Socrates (born 469 B.C.) was a young man. Since there is no reason to think these relative dates are distorted by dramatic license or that Plato was misinformed, and since our other chronological data come from much later sources and are inconsistent among themselves, we have no choice but to assume that, as Plato implies, Zeno was born around 490 B.C. Since he wrote his book as "a young man" (*Parm.* 128d), it is likely that he produced his paradoxes in the sixties, quite possibly in the early sixties, of the fifth century B.C. Plato speaks of only one book (and so does Simplicius, *Phys.* 139, 5). The attribution to him of more than one book by a late source (Suidas; in DK 29A2) appears to be baseless. Of other facts concerning him, we can be certain only that he was a citizen of Elea, a familiar of Parmenides, and an adherent of his system, defending it against those who ridiculed it (Plato, *Parm.* 128c, d).

ARGUMENTS AGAINST PLURALITY

There were many arguments against plurality (forty, according to Proclus, in DK 29A15). Two of them contain most of what survives in Zeno's original wording (Frs. 1, 2, and 3; in DK, 29 B1, 2, 3) and therefore merit the most careful study.

First argument. In the first argument against plurality, Zeno undertook to prove that "if [*P*] there are many [existents], they must be both [*Q*] "so small as to have no size" and [*R*] "so large as to be infinite" (Simplicius, *Phys.* 141, 6–8). His argument had three sections: the proof of [*Q*], the transition to the proof of [*R*], and the proof of [*R*].

Proof of [*Q*]. The proof of [*Q*] has been lost. But Simplicius, who must have had its text before him (he proceeds to quote Frs. 1, 2, and 3), reports

From Paul Edwards, ed., *The Encyclopedia of Philosophy* (New York: Macmillan, 1967), vol. 8, pp. 369–79. Used by permission. Two errors in this article noted in "Zeno's Race Course," reprint in Furley-Allen II, p. 220 n. 38, have been corrected in recent editions of the *Encyclopedia of Philosophy*. The brief in-text references are more fully documented in the Bibliography at the end of this article.

(*Phys.* 139, 18–19) that Zeno had argued “that nothing has size” on the ground that “each of the many is self-identical and one.” Perhaps the further premise on the strength of which Zeno negotiated this curious inference is revealed in Melissus’ Fragment 9; it would be good Eleatic doctrine to hold that if a thing is one it can have no parts, or else it would be “many.” Zeno’s argument in support of [Q] might then have run as follows:

- [A1] If there were many things, each of them would have to possess (as minimal conditions for existence) unity and self-identity.
- [A2] But nothing can have unity if it has size,
- [A3] for whatever has size is divisible into parts,
- [A4] and whatever has parts cannot be one
- [A5] Hence, if there were many things, none of them could have size.

Here premise [A1] is impeccable and premise [A3] innocuous. But what of [A4]? Since such predicates as “one” and “many” are semantically incomplete or elliptical, there is no reason whatever why the same logical subject could not be both “one” and “many,” provided only the needed complements to the sense were appropriately different; for example, the United States is one (nation) and many (states), an apple is one (apple) and many (parts—halves, quarters, billionths, and so on—of an apple). This truth is so elementary that the reader may wonder if a thinker of Zeno’s undoubted powers could have missed it. He might then be reminded that even in Plato’s time the logical viability of any conjunction of unity with plurality was disputed by some philosophers (see Plato, *Soph.* 251b, c). There is no good reason to doubt that Zeno, a century earlier, could have fallen into the same semantic trap. His error must have passed undetected, or else it would not have been repeated innocently by Melissus in his Fragment 9.

Transition to the proof of [R]. Zeno next argued that, on the contrary, if there were many existents, each of them would necessarily have some size (greater than zero).

For [a] if it [a sizeless existent] were added to another existent, it would make it [the latter] no larger. For [b] having itself no size, it could contribute nothing by way of size when added. And thus it would [369] follow that [c] the thing added would be nothing. If, indeed (*de*), [d] when [something is] subtracted from another, the latter is not reduced, nor again [is the latter] increased when [the former is] added [to it], it is clear that what is added or subtracted is nothing. (Fr. 2)

The clumsiness of the writing is evident from the parenthetical additions needed to keep the bound variables of the reasoning under control, but this is scarcely surprising in the archaic age of argumentative prose. What of its logic? The major question concerns step [d]. Does Zeno want us to think it a *conclusion* from what precedes? This would be a blunder, since [d] merely restates in a more general form (expanded to cover subtraction as well as

addition) the assumption by which the preceding argument would have to be justified; in the version above, no reason was offered for the startling inference from [a] to [c]. But Zeno’s text can very well be read with [d] as an assumption (one could even read the connective, *de*, as “because,” as von Fritz did in his review of Calogero’s *Studi sull’eleatismo*, 105), so that the logical sequence would be as follows:

- [d] If an existent did not increase another when added to it, nor yet decrease it when subtracted from it, that existent would be nothing.
- [a, b] A sizeless existent would not increase another when added to it [nor yet decrease it when subtracted from it]
- [c] Therefore, a sizeless existent would be nothing.

Here it is quite clear that no attempt is being made to prove [d]. This is understandable, since [d] is a premise that everyone (except Eleatic philosophers) would have granted at this time, for it is obviously true of all corporeal existents. And because (outside of Eleatic circles) the conception of *incorporeal* existents had not yet dawned, no one would have felt any good reason for doubting [d]. It might be objected, “Has not Zeno professed to *prove* in the preceding section that existents are sizeless? Would not this entail that they are incorporeal?” This would be true, but irrelevant, since Zeno’s tactics are purely dialectical. To prove that his adversaries hold contradictory beliefs, Zeno is perfectly justified in picking out different sets of premises to suit his purpose, working with one set that excludes [d] in the proof of [Q] and then beginning all over again in the transition to the proof of [R] with another set of premises, all of which, including [d], his victims would have granted him readily at the start of this debate.

Proof of [R]. Zeno’s proof of [R] is as follows:

So if [many] exist, each [existent] must have some size and bulk and some [part of each] must lie beyond (*apechein*) another [part of the same existent]. And the same reasoning holds of the projecting [part]: for this too will have some size and some [part] of it will project. Now to say this once is as good as saying it forever. For no such [part—that is, no part resulting from this continuing subdivision] will be the last nor will one [part] ever exist not [similarly] related to [that is, projecting from] another. (Fr. 1, [Zeno B1] first part)

The phrasing here is even clumsier than that of the preceding fragment, so much so that the correct translation has long been missed (for the one given here—see Frankel, 193ff. and the Vlastos review of the German version, 19596). On its simplest construction the reasoning goes as follows: Given any existent, A, it must have size—as Zeno has proved in the transition to the proof of [R], above—and therefore at least two nonoverlapping parts or regions, B and C, must be distinguishable within it. In default of more technical terms in his vocabulary, Zeno speaks here of C as “lying beyond” or “stretch-

ing out away from" (*apechein*) or again as "sticking out [or projecting] from" or "being ahead of" (*proechein*) *B*. The same will be true of *C*; it too will have nonoverlapping parts *D* and *E*. This argument can be reiterated ad libitum. Hence, the series of "projecting" parts (*C*, *E*, *G*, . . .) is unending.

To resume Simplicius' citation (of the apparently intact original text), Zeno concluded, "Thus, if there are many, they must be both small and great: on one hand, [*Q*] so small as to have no size; on the other, [*R*] so large as to be infinite" (Fr. 1, concluding part).

Given Simplicius' testimony (*Phys.* 139, 18–19, cited before), we have no choice but to take [*Q*] here as a carryover from the proof of [*Q*] given above. But how is [*R*] supposed to follow? Zeno must have been proceeding on two assumptions:

- (C1) An infinitely divisible existent must contain a complete infinity of parts.
- (C2) If each member of an infinitely numerous set has some size (greater than zero), then the aggregate size of the set must be infinite.

But why should he assume (C2)? By the rule of the construction, nothing goes into the set (the one consisting of the complements to the projecting parts, that is, *B*, *D*, *F*, . . .) except parts of existent *A*, each of them finite (because *A* is finite; if *A* were infinite to begin with, the argument to prove it so would be redundant) and ordered in a sequence whose *n*th term is always smaller than the difference between *A* and the sum of the preceding *n*–1 terms. In a simple case (probably the very one that Zeno had in mind, given his fondness for "dichotomy"), the *n*th term is always $A/2^n$. Simple arithmetic, well within Zeno's reach, would have shown him that any partial sum of this sequence ($A/2 + A/4$ or $A/2 + A/4 + A/8$ or . . .) would be less than *A*. Assuming then [(C1) above] that the whole sequence would be given as a complete totality, why should he think its sum would be larger than *A*, and so much so as to be infinitely large? He must have made a further assumption:

- (C3) An infinite sequence of terms of decreasing size must have a *smallest* term, *e.*

On this assumption, *A* would contain infinitely many parts larger than ϵ (which, like all other parts in the collection, would have a finite size greater than zero). The sum of *this* collection would indeed be infinite: it would have to be at least as large as ϵ times infinity. But (C3) unfortunately entails [370]

- (C4) An infinite sequence of terms of decreasing size must have a *last* term

which contradicts the point made in Zeno's text that the sequence has no last member ("for no such [part] will be the last . . ."; Fr. 1, first part).

Is Zeno's error here more shocking than the quite different one he made in the proof of [*Q*] above? Hardly. Thinkers in much later periods, commanding far more advanced analytic tools, have not shrunk from saying point-blank

that an infinite sequence *must* have a last ("infinitieth") member; thus, Jakob Bernoulli wrote, "if 10 members are present (in an infinite progression), the 10th necessarily exists, if 100 then necessarily the 100th, . . . if therefore their number is infinite then the infinitieth member must exist" (quoted in Weyl, p. 44). A similar illusion, supervening on the conviction that because every term in the series had some (finite) size, so must this one, would account for his error. Had Zeno formulated these propositions, he could scarcely have failed to notice the ensuing clash with the "no last member" clause in his own text. Remaining tacit, the propositions were shielded from critical scrutiny, and the contradiction could pass undetected. Nor did he have, to rouse his suspicions against assumption (C2), the conception that the sum of an infinite series could be defined as the limit on which its successive partial sums converge. No one had this conception in antiquity; infinite sequences are not summed by this means in "exhaustion" proofs in Euclid and Archimedes (see Boyer, pp. 34–37, 52–53). In the absence of this conception, (C2) could not have seemed nearly as counterintuitive as it seems to us. We know this from the fact that Epicurus endorses (C2) without the slightest qualms (*Ep. ad Hdt.*, Secs. 56–57; in Diogenes Laertius, *Vitae philo.*, H. S. Long, ed., 2 vols., Oxford, 1964, II, p. 521, lines 3–4 and 7–14), and not only he; it was apparently a widespread assumption in antiquity. (Eudemus *apud* Simplicius *Phys.* 459, 25–26; Sext., *Pyrroh. hyp.* 3, 44; Simplicius, *Phys.* 141, 15–16 *et passim*; and *De caelo* 608, 12–15; 635, 11–26. Cf. Salomo Luria, pp. 106–7.) Indeed, there is good reason to think that Aristotle himself would have approved it, and he even comes close to doing so in *Phys.* 187b13–34; he was saved by his ingenious theory of the "potential" infinite, which enabled him to sidestep the question, "What is the sum of an infinite series?" by denying the "actual" existence of any such series to sum.

Second argument. The second argument against plurality goes as follows:

If [*P*] there are many, it is necessary that [*Q*] they be as many as they are, neither more nor fewer. But if they are as many as they are, they must be finite[ly many].

If [*P*] there are many, [*R*] the existents must be infinite[ly many]. For there are always other [existents] between existents, and again others between these. And thus the existents are infinite[ly many]. (Fr. 3)

The argument for [*Q*], beautiful in its simplicity, is so strong that it is hard to see how anyone could have broken it before the demonstration of transfinite cardinals and superdenumerable sets by Georg Cantor. Otherwise how could the claim that every determinate set is numerable be disproved and the inference from a *definite* totality ("so many as they are") to a *finite* one be invalidated? All one could have done in the circumstances would have been to counter with a *tu quoque* argument — for example, that by the same reasoning one could show that the infinity of the natural integers involves a contradic-

tion. But would Zeno have had to fear such a counterattack? His Eleatic faith that only the One exists would have derived further comfort from the assurance that even that paradigmatic aggregate, the number series, is flawed by contradiction.

The argument for [R] makes a new assumption:

(D1) Given two existents, there must be at least one between them.

From this it follows that given three existents, there must be at least two more (a fourth between the first and the second, a fifth between the second and the third) and so, generally, if there are n existents, there must be at least $n - 1$ more. Is (D1) puzzling in view of the fact that the preceding argument allowed for (and, as interpreted, entailed) the distinctness of contiguous existents? Not if we remember Zeno's dialectical method, which picked its premises wherever it found them. Here Zeno may have been thinking of existents that are not only conceptually distinct but also physically separate, counting on his public to grant him that physical separation between any two things is impossible if there is nothing between them to hold them apart. Or, again, he may have been thinking of points on a line, in which case (D1) enunciates the mathematical "denseness" of a continuum. In either case he would have all he wanted here—supposed existents whose numerousness can be proved infinite by a simple rule.

Third argument. It is highly probable that a Zenonian original is behind an Eleatic argument which Aristotle reported in *De gen. et cor.* 316a14–34, 325a8–12 and which forms the second half of an argument that Porphyry ascribed to Parmenides but which Alexander and Simplicius held more likely to have been Zeno's (Simplicius, *Phys.* 139, 24–140, 26). The argument is, in substance:

[E1] If [H_1] an existent were infinitely divisible, no contradiction should arise from the supposition that [H_2] it has been divided "exhaustively" (or "through and through," *pantēi*).

[E2] But an exhaustive division would resolve the existent into elements of zero extension. This is impossible, for

[E3] no extensive magnitude could consist of extensionless elements.

This argument was a great success in antiquity. Aristotle spoke of it (*De gen. et cor.* 316b34) as the very argument which convinced the atomists that the infinite divisibility of matter was absurd. His own refutation of it (*ibid.* 316b19ff.) made no dent on later atomists: Epicurus must have thought the argument perfectly valid, or else he could not have asserted so confidently that if matter were infinitely divisible, being would be reducible to not-being (*Ep. ad Hdt.* 56; in Diogenes Laertius, II, p. 521, lines 4–7). Even in modern times some eminent historians of Greek science and mathematics recount the argument as though its reasoning were logically cogent (Tannery, "Le

Concept scientifique du continué" 391–92, and *Pour l'histoire de la science hellène*, pp. 254–55; Heath, *History of Greek Mathematics*, p. 275; Baccou, p. 181). But it is certainly an invalid refutation of hypothesis H_1 , that an existent is infinitely divisible. Correctly analyzed, this states no more than that the sequence of divisions to which the existent may be subjected has no lower bound. Thus, it assures us that no matter how many divisions have been performed on it, *a next division may be performed*. But supposition H_2 , that the existent has been divided exhaustively, states that the whole sequence of divisions envisaged in H_1 has been completed and a state of affairs has been reached in which *no next division may be performed*. Here we have two entirely distinct hypotheses, and it is by no means clear that the first entails the second. Hypothesis H_2 certainly does not follow from the meaning of H_1 , any more than, for example, if one were to assert that (a) counting the whole numbers is an endless process, then one could be understood to mean that (b) it is possible to have counted them all: one might very well mean to deny (b) while asserting (a); one might even believe that (a) is a good reason for denying (b). Therefore, if left unsupported, the claim that H_1 entails H_2 is a sheer *non sequitur*. This is precisely the fault committed by the first premise, [E1], of the argument, it assumes, without the slightest proof, that H_1 entails H_2 , for if—as alleged, a contradiction were to result from the supposition that the sequence of divisions has been exhaustively carried out (i.e., that H_2 has been instantiated), this would do absolutely nothing to falsify H_1 unless its logical fortunes were tied by entailment to those of H_2 .

It might be noted that this refutation of the argument does *not* assert that H_1 entails the contradictory of H_2 . This assertion would raise the more general question whether or not the notion of a completed infinite sequence of this type is logically self-contradictory, which may be held over for the discussion of the next puzzle. Here it need be said only that the argument could be faulted on this further ground if it assumed that the alleged exhaustive division of the existent could be brought about only by a *last* division, which, of course, H_1 positively precludes, a sequence of this ordinal type (which has a first member and whose every subsequent member has a successor) can have no last member. But the argument as stated above (incorporating all that is correctly derivable from the data on this point) does not make this further assumption. (The assumption has been read into it by Tannery, Heath, and Baccou, thereby exposing it to refutation on just that ground by Grünbaum in *Philosophical Problems of Space and Time*, pp. 167–68.)

What of premise [E3]? Its truth would be acknowledged by all ancient thinkers, since they never envisaged the possibility that an extensive magnitude could be constituted of parts except insofar as it could be conceived as resulting from their arithmetical addition—an operation that obviously could not be performed on extensionless points to produce lines, planes, and solids. Hence, the modern mathematical conception of the set-theoretic union of a

(superdenumerably infinite) set of points to form a one-dimensional continuum (cf. Grünbaum, *Philosophical Problems*, pp. 161ff.) could scarcely count as a valid objection to the assertion of [E3], although it might well be fatal to certain inferences which otherwise might be drawn from [E3].

ARGUMENTS AGAINST MOTION

Not even one line of the arguments against motion has survived in Zeno's original wording. What we know of them derives almost exclusively from Aristotle's accounts of them in the *Physics*. These accounts have been subject to so many diverse interpretations that it would be quite impossible to expound all of them in this article, to say nothing of assessing their respective merits. The best that can be done here is to offer the most probable construction of their reasoning, referring the reader to two recent studies (Vlastos, "A Note on Zeno's Arrow" (**1.205ff.) and "Zeno's Race Course" (**1.189ff.)) for the textual justification.

The Race Course. The argument of the Race Course, to which Aristotle alludes in *Phys.* 239b11–13 and 263a4–6, is as follows:

Starting at point *S*, a runner cannot reach the goal, *G*, except by traversing successive "halves" of the distance, that is, subintervals of *SG*, each of them $SG/2^n$ (where $n = 1, 2, 3, \dots$). Thus, if *M* is the midpoint of *SG*, he must first traverse *SM*; if *N* is the midpoint of *MG*, he must next traverse *MN*; and so forth. Let us speak of *SM*, *MN*, *NO*, . . . as the *Z-intervals* and of traversing any of them as *making a Z-run*. The argument then comes to this:

- [F1] To reach *G*, the runner must traverse all *Z-intervals* (make all the *Z-runs*).
- [F2] It is impossible to traverse infinitely many intervals (make infinitely many *Z-runs*).
- [F3] Therefore, the runner cannot reach *G*.

But why would Zeno assert [F2]? Probably because he made the following further assumption:

- (F4) The completion of an infinite sequence of acts in a finite time interval is logically impossible.

This assumption has enormous plausibility. Even in our own time, several distinguished thinkers have argued that it is true (Weyl, p. 42; Black, pp. 95ff.; Thomson, pp. 5ff.). Has a good case been made for it? An easy way to do so would be to assume that "completing" the sequence here could be defined only as "performing all the acts in the sequence, *including the last*." If such a definition were mandatory, then, of course, a completed infinite progression such as the *Z-sequence* (which can have no last member) would be as flat a contradiction as a round square. But "completing" the sequence can be

defined, alternatively, as "performing all the acts in the sequence" or "reaching the point when no more acts in the sequence remain to be performed, having omitted none" (see Watling, p. 39; Owen, p. 205). Hence, to settle the issue by recourse to the first definition would be to beg the question. Nor, again, would it do to argue that the sequence is uncompletable because *no matter how large a number of acts had been performed*, more of them would still remain to be made (see Black, p. 101). This, too, would beg the question, unless "number" in the italicized phrase were corrected to "finite number," in which case we would get only the tautology that the infinite sequence could not be completed by a finite number of acts.

When the argument for (F4) has been kept clear of both these mistakes, it has so far failed (see Benacerraf, pp. 768ff.). The most that can be done is to demonstrate a much weaker proposition,

- (F5) The completion of an infinite sequence of discrete acts (or states) in a finite time interval is impossible for a *finite state system* (that is, for one which at any given instance is in one of *n* possible states, where *n* is finite).

Thus, suppose (1) a system were at any instant in one of two possible states, *A* and *B*, the occurrence of one of them immediately preceding the occurrence of the other, and (2) that the system went through infinitely many state alternations between, say, 10:00 and 10:01, *A* in the first half minute, *B* in the next quarter of a minute, *A* again in the next eighth, and so forth. A contradiction would then arise: Given (1), the system would have to be in one of the two states at 10:01. Let this state be *A*. The occurrence of *A* would require, as its immediate predecessor, a unique occurrence of *B* prior to 10:01. But, given (2), this would be impossible: no occurrence of *B* prior to 10:01 could be *A*'s immediate predecessor, for every such occurrence would be separated from the occurrence of *A* at 10:01 by infinitely many occurrences of both *A* and *B*. This shows that the complete infinite sequence of discrete states hypothesized in (2) is impossible for those physical systems which satisfy (1)—that is, those that are finite state systems. But this, unfortunately, will not cover the *Z* runner of Zeno's puzzle, for his progress toward *G* does not constitute a finite state system: the state of being at *G* ("the *G*-state") does not bear the same relation to the state represented by the traversal of some *Z-interval* (some "*Z*-state") that any occurrence of *A* bears to some occurrence of *B* in (1). In the case of (1) we can always count on an immediate predecessor for any given state. Not so in the *Z*-runner's case, where (by hypothesis) the *G*-state has no *Z*-state as an immediate predecessor. Thus, the demonstration of (F5) would not be of the slightest use for Zeno's purposes. Hence, the logical impossibility of the completed *Z-runs* remains to be proved.

What then of their *physical* impossibility? This no one would dispute. Everyone would concede that no human runner could execute an infinite set of discrete physical motions answering to the *Z-runs* of the puzzle. But how

would this concession advance Zeno's case? Has he done anything to show that such a set of motions *must* be made if the runner is to move from *S* to *G*? He has not! Consider how the word *run* has been used in the argument: its normal use restricts it to physically individuated motions. Thus, a man who ran from point *X* to point *Y* without a break would have made one and only one run; he could not be said to have made even two runs (let alone an infinite number) unless he made a stop or near stop in between. This restriction has been quietly ignored on Zeno's behalf in expounding his argument. We have allowed him a radically different use of the term, according to which *the traversal of any interval we please* by a runner would count as a "run." Let us then write " run_a " for the normal use of the word, " run_b " for its entirely different use in the exposition of Zeno's argument and consider the consequences: Since we may take *SG* to be as many (contiguous) intervals as we please, it follows that we may take the single *SG* run_a to be as many (contiguous) runs_b as we please. Thus, it could be said quite truthfully to be two runs_b (for example, traversals of the *SM*, *MG* intervals), or a billion runs_b (traversals of a billion contiguous segments of *SG*, each of them a billionth of the total length of *SG*), or \aleph_0 runs_b (for example, traversals of all the *Z*-intervals). Therefore, the fact that the runner has to make infinitely many *Z*-runs would not begin to justify [F2] if they are only runs_b . This being the case, why should there be any difficulty about making all the *Z*-runs when all that is needed for this purpose is to make the single run_a from *S* to *G*—just as all that is needed to consume \aleph_0 parts (parts_b) of an egg is simply to eat an egg?

A possible answer is still left to Zeno, well worth presenting on his behalf so that we may explore the last logical resources of his position without any suggestion that, on the available evidence, he himself was likely to have exploited them in this way. Conceding, as he now must, that he has not proved, and could not prove, that all the Z-runs_b must be made before the runner can reach *G*, he could point out that it would suffice for his purpose to prove the impossibility of making all of the Z-runs_b (all of which must indeed be made—no *Z*-interval may be skipped). He could argue for this as follows: Although these *Z*-runs (the subscript may be dropped now that it has served its purpose) are not physically individuated motions, neither are they arbitrary fictions. Each of them represents a determinate subsegment of the runner's physical motion. Therefore, all of them taken together make up a true description covering the whole of his run from *S* to *G*, accounting for every part of it exclusively in terms of *Z*-runs. How could this be, when (by construction) every *Z*-run terminates short of *G*, and hence no *Z*-run reaches *G*? How could there be a true description of an event (the run from *S* to *G* represented solely in terms of *Z*-runs) whose occurrence entails the fulfillment of a condition (that of making a run that reaches *G*), when the description entails the non-fulfillment of that condition (since none of the runs that figure in the description reaches *G*)?

Here our "Zeno" has fallen back on a new assumption:

(F6) Any point reached by running must have been reached by a unique run that reaches that point (i.e., that terminates at or beyond that point).

Could any assumption be intuitively more compelling? But if we were to grant it, we would have lost the argument. [373] For we could not then hope to get out of the difficulty by retorting that (F6) could easily be shown to be satisfied by some other equally true description of the *SG* motion (for example, as the one run from *S* to *G*). This maneuver would be futile. It would leave us with the paradox that (F6), known to have been fulfilled on this true description of the motion (that is, as the *SG* run), would be known to have been unfulfilled (not merely not known to have been fulfilled) on another, no less true, description of the very same motion, the one accounting for the whole of it exclusively in terms of *Z*-runs. To escape this paradox, we must reject (F6), explaining that whereas it is a sufficient condition of reaching a point by running—the normal one, the only one we need consider in everyday experience—it is by no means a logically necessary condition: On the Zenonian description of the runner's motion, he is in a position to make *n* *Z*-runs, where *n* can be made as large as necessary to cut to less than any preassigned, arbitrarily small interval ϵ the difference between the sum of *n* *Z*-intervals and the length of *SG*. This means that he is in a position to traverse an interval which is *metrically indistinguishable* from *SG*—a perfectly good way of "reaching" *G* without having to comply with assumption (F6).

Throughout this discussion we have ignored another of Zeno's tacit assumptions: that an extremely strong physical interpretation is available for the crucial concepts, particularly that of reaching (or being at) a point. Zeno assumes that any position reached by the runner after traversing a finite number of *Z*-intervals—say, after a trillion of them—would be physically distinguishable from the terminal one at *G*, as it would also be from infinitely many others intermediate between it and *G*. The shortest way to refute him would have been to point out that the falsehood of this assumption vitiates the conclusion of his argument. We have forgone this line of refutation in the preceding discussion and will do so again in the *Achilles*, in order to show that even if we were to assume that the positions of Zeno's mobiles could be fixed on their physical trajectories with a precision as absolute as that of geometrical points on a linear continuum, Zeno's arguments would still fail. (For Aristotle's alternative construction of Zeno's error in the *Race Course*, see Vlastos, "Zeno's Race Course," 96–97 (**1.190–92); for references to some other constructions, see 106n.33, (**1.200n.33))

The Achilles. The argument of the *Achilles*, to which Aristotle refers in *Physics* 239b15–18, is as follows. As Achilles starts from point *S* toward point *A*, the tortoise, already at *A*, moves ahead. If her speed is *r* times that of Achilles (where *r* is a small fraction, say, $1/100$), then in the same time, *t*, that

Achilles takes to traverse SA (whose length is s), she will traverse $AB (=sr)$. For the same reason, in the time (now tr) he takes to run through AB , she will traverse $BC (=sr^2)$. Thus, we get the unending progressions indicated in the accompanying table.

The Z-Sequences	The Z-Runs			
	Run 1	Run 2	Run 3	
For Achilles ("the ZA-sequence")	$SA (= s)$	$AB (= sr)$	$BC (= sr^2)$	
For the tortoise ("the TA-sequence")	$AB (= sr)$	$BC (= sr^2)$	$CD (= sr^3)$	
The temporal sequence the same for both	t	tr	tr^2	

The argument goes as follows:

- [G1] Achilles and the tortoise make contemporary Z-runs (that is, such that their n th Z-run begins and ends at the same instant [$n = 1, 2, 3, \dots$]).
- [G2] The n th Z-run of the tortoise and the $(n + 1)$ th of Achilles traverse identical Z-intervals.
- [G3] Achilles will catch up with the tortoise if and only if a Z-run by Achilles and a Z-run by the tortoise reach the same point at the same instant.
- [G4] But, given [G2], at the end of any Z-run the tortoise will be one Z-interval ahead. Therefore, given (G3).
- [G5] Achilles will never catch up with her.

However different from the Race Course in design, this puzzle has been built from the same materials: sequences decreasing unendingly in constant ratio, whose members are intervals of space and time. The Z-runs are, as before, runs, masquerading as runs. When they are unmasked, [G1] and [G2] remain true by construction, and [G4] is a valid consequence. But does [G5] then follow? Obviously not, unless (G3) were also granted. This ultra-plausible premise plays here the same role as did (F6) in the Race Course and may be rejected on the same grounds: although true enough in ordinary circumstances, it would not be true in the extraordinary ones postulated by Zeno. For there exists a point Q such that the segments SQ and AQ are respectively the limits of the infinite sequence of partial sums of the ZA-series and the ZT-series. If Achilles could make the SQ run, the tortoise would make the AQ run in precisely the same time, and she would be overtaken at Q . By restricting them to Z-runs, Zeno ensures that the SQ and AQ runs will not be made, since

neither of them would then make a run which terminates at Q . Even so, the infinite sequence of Z-runs would enable each of them to approach Q within any desired standard of approximation, and Achilles would thus have a perfectly good way of catching up with the tortoise without satisfying (G3). (For references to some other interpretations of this puzzle, see Vlastos, "Zeno's Race Course," (**1.202–4 and nn.).)

The Arrow. By putting together data drawn from Aristotle's (brutally abbreviated) summary of the Arrow puzzle (*Phys.* 239b5–7) and from another source (Diog. Laert., II, p. 475, lines 10–11, which is the same as Zeno, Fr. 4, in DK); we get the following argument:

- [H1] The arrow could not move in the place in which it is not.
- [H2] But neither could it move in the place in which it is.
- [H3] For this is "a place equal to itself,"
- [H4] and everything is always at rest when it is "at a place equal to itself."
- [H5] But the flying arrow is always at the place in which it is.
- [H6] Therefore, it is always at rest.

Premises [H1] and [H2] are from Diogenes Laertius; [H3] is supplied as a transitional sentence; [H4] is cited verbatim [374] and [H5] adapted, with modifications, from Aristotle. (For a defense of this reconstruction, see Vlastos, "A Note on Zeno's Arrow," (**1.205–9).)

Premise [H4] is the pivot of the argument. It could mean two quite different things depending on how we read its "when" (see Black, pp. 128 and 144–46; Owen, 216ff.):

- [H4.i] Everything is always at rest for any *interval* during which it is "at a place equal to itself."
- [H4.ii] Everything is always at rest for any (durationless) *instant* in which it is "at a place equal to itself."

The second reading offers the simpler explanation of the fact that Zeno thought premise [H4] not merely true but so plainly true that he felt no need to argue the point. If we think of the arrow as occupying a given position—being at a place just "equal" to its own dimensions—for a bare instant of zero duration, it will be obvious enough that it cannot be moving just then, for it will have no time in which to move (cf. Black, pp. 133–34). And if the arrow is not moving, must it not be at rest? Even today many persons would be caught off guard by this question and answer unhesitatingly, "Yes."

Fortunately, we have the means for correcting the error—for example, the familiar $v = s/t$ formula. Since a body at rest has zero velocity and covers zero distance, we must have values of zero for both v and s to represent the body's being at rest. But on the hypothesis that the body is nonresting for an instant of zero duration, t would also have to have a value of zero, and we would then get $v = 0/0$, which is absurd, because $0/0$ is a meaningless arithmetical sym-

bol. The only way to have $s/t = 0$ is to assign a value greater than zero to t —that is, to represent the body as being at rest during some temporal interval, however short. Aristotle satisfied himself of the same result without benefit of algebra by means of an analysis of the instant in *Phys.*, Book VI, which showed that “neither moving nor resting are possible in the ‘now’ [Aristotle’s term for the instant]” (*Phys.* 239b1–2; see also 234a24ff.).

However, even this would not dissolve the perplexity unless it were pointed out, more explicitly than Aristotle does, that both moving and resting for an instant are not merely false but senseless; the arrow is nonmoving and resting for an instant in much the same way that a point is nonstraight and noncurved. For otherwise Aristotle’s remark, for all its truth, might simply provoke the question, “But if the arrow is not moving for any given instant of its flight *when* and *how* does it manage to move?” The “when?” may be answered curtly by “During some interval containing the given instant.” But for the “how?” one must go deeper, exposing the category-mistake that lurks behind the question. Nor can one stop there. One must still explain that while motion *for* (that is, *during*) an instant is senseless, excellent sense can be given to motion *at* an instant by taking “velocity at instant i ” to mean the *limit* of average velocities during intervals converging to zero and always containing i (cf. Black, p. 144). This, needless to say, would take one a long way past Aristotle, let alone Zeno, whose temporal concepts were as far behind Aristotle’s as are Aristotle’s behind the modern analysis of motion. (For a different reconstruction of the puzzle, using only the Aristotelian data and the [H4, i] interpretation of the “when,” see H.D.P. Lee, p. 78.)

The Moving Blocks. The Moving Blocks argument, often called the Stadium, appears in Aristotle, *Phys.* 239b33–240a17. The reasoning runs as follows:

There are three sets of blocks; since one member of each set will carry the reasoning, we may cut down the machinery to three blocks, A , B , C . Their edges are of equal length, s . Block A is stationary, and blocks B and C are moving past A in opposite directions at equal speeds. We are then supposed to get a contradiction: B will traverse distance s both in a given time, t , and in half that time, $t/2$, where t and $t/2$ are the times that B ’s leading edge takes to move past A and C , respectively. “So it follows, he thinks, that half the time equals its double [that $t/2 = t$]” (Aristotle, *Phys.* 239b35). Aristotle and all our other ancient informants understood this as a (supposed) paradox of relative motion. Although Eudemus thinks it “very silly” and its paralogism “most obvious,” neither he nor anyone else in antiquity doubted—on this or any other ground—its Zenonian provenance.

Other interpretations. According to a different interpretation of the Moving Blocks puzzle, popular among modern scholars since first put forward by Paul Tannery (see, for example, Brochard, pp. 7–9; Ross, pp. 81–82; Owen, 208–9; Whurow, pp. 135–37), blocks A , B , and C would stand for indivis-

ibles and the reasoning would prove that B , traversing an atomic quantum of length q_s relative to A in an atomic quantum of time q_t , would traverse length q_s in $q_t/2$ relative to C , thereby dividing a supposed indivisible. Unfortunately, we have nothing to persuade us that there is any historical substance to this conjecture, for there is no hint in any of our sources that any of the quantities in the reasoning were meant to be atomic.

TWO MORE PARADOXES

Against Place. The argument against place, which appears in Aristotle, *Physics* 209a23–25 and 210b22–24, runs as follows:

- [J1] Whatever exists is in a place. Therefore,
- [J2] place exists. Therefore, given [J1] and [J2],
- [J3] place is in a place, and so on *ad infinitum*

Premise [J1] was so widespread and tenacious an assumption that “ x is nowhere” was one way of saying “ x does not exist” (see, for example, Plato, *Phaedo* 70a2; cf. Aristotle, *Phys.* 208a30–31), and Plato could declare, “We [people generally, *not* Platonists] say that it is necessary for whatever exists to be in some place and to occupy some space” (*Tim.* 52b). Zeno used this premise to discredit [J2]. Taking “place” to mean “position” (as in the Arrow), he argued that [J1] in conjunction with [J2] entails in [J3] the semantic absurdity that a position has itself a position in turn. But does [J1] entail this nonsense? To show that it does not, Aristotle found it necessary to exploit a fourth-century discovery, that “to be” (there is no separate word for “to exist” in his language), and hence “to be in” has many senses. Along such lines one could refute the supposed entailment, explaining how very special a sort of existent “place” is, how different from those which do [375] “exist in a place.” But since this could not be done with the conceptual tools available in Zeno’s time, his argument would be unassailable from this quarter, and it is hard to see how else it could have been routed in mid-fifth century.

The Millet Seed. According to the puzzle of the Millet Seed (presented in Aristotle, *Phys.* 250a19–21 and in Simplicius, *Phys.* 1108, 18–28), if a bushelful of millet makes a noise when it falls, why should not a single millet seed make a proportionately smaller one and a ten-thousandth part of a millet seed one that much smaller?

Zeno is insinuating that we are fools to believe our ears when they report a hoarse shaking thud but are deaf to more diminutive agitations. Such a criticism of the senses could scarcely have come except from someone who was prejudiced against them to begin with—as the Eleatics, and only they, are known to have been at the time (see Parm., Fr. 7, Mel., Fr. 8). A more impartial critic would have felt the necessity of giving some reason why audible

sounds, when ordered by decreasing size, should have no lower bound. The fact is that they do. Why should that count against them? Why should our insensitivity to subliminal stimuli discredit our sensitivity to those above the limen?

INFLUENCE AND CONTRIBUTIONS

Scholarly opinion on Zeno's influence was dominated during the first half of the twentieth century by a theory put forward in 1885 by the distinguished French historian Paul Tannery, which was incorporated in one form or another into most of the leading histories of Greek mathematics, science, and philosophy of the next sixty or seventy years. Tannery's interpretation included the following theses: (1) Zeno's arguments were not directed against the commonsense belief in plurality and motion. (2) They were aimed against a very special philosophical doctrine which, Tannery claimed, was held at this time by the Pythagoreans—that all objects are made up of elements which were expected to combine somehow the properties of the arithmetical unit, the geometrical point, and the physical atom. Moreover, (3) these Pythagoreans thought that time and motion were similarly discontinuous. (4) Zeno's arguments, understood as onslaughts against (2) or (3) or both, were seen to be "clear, forceful, irrefutable—even those in which nothing but simple paralogisms had been commonly seen" (*Pour l'histoire de la science hellène*, p. 251). (5) "Zeno's success was complete" (*ibid.*). "The theses he had attacked never reappeared after him" (*ibid.*, p. 260). (6) The result was salutary for Greek mathematics, ensuring for it "rigorously precise . . . notions of the point and the instant" (*ibid.*, p. 248). This last contention was given a further twist by another historian of mathematics, H.-G. Zeuthen, who interpreted the unit-point-atoms of Tannery's Pythagoreans as infinitesimals by which, he thought, they had sought to save their doctrine that "all things are numbers" in the face of the discovery of incommensurable magnitudes: by assuming that all continuous magnitudes, physical and geometrical, were composed of "infinitely many infinitely small parts" (Zeuthen, pp. 65–66), the Pythagoreans, according to Zeuthen, could claim that these magnitudes did have a common measure—an infinitely small one—after all.

Zeno and the Pythagoreans. To review the arguments that have been offered for Tannery's theory would be quite impossible in this article. Here, with the utmost brevity, are the reasons why thesis (2) must be considered probably false and this theory's other five theses certainly so:

To accept thesis (1), we would have to set aside the unanimous opinion of antiquity that Zeno was a faithful Eleatic, fully as much so as was Melissus. As such he could not but reject *all* current professions of plurality and

motion—starting with those of the man in the street. Nor is there any hint in any of our sources, from Plato to Simplicius, that Zeno's arguments were aimed at any particular philosophical school or had a greater bearing on the views of the Pythagoreans than on those of other people (see Heidel, pp. 21ff.; Burkert, pp. 264ff.).

In the case of thesis (2), the only texts that have been (or could be) offered as evidence that a unit-point-atom doctrine was professed by *early* Pythagoreans are of uncertain relevance (it is by no means clear that the units "possessing magnitude" which Aristotle ascribed to Pythagoreans in such passages as *Met.* 1080b16ff. and 1083b8ff. are *point-atoms*) and absolutely without chronological specification (there is no indication in these texts that Aristotle had in view these doctrines professed by Pythagoreans more than a hundred years before his own time rather than contemporary ones). Moreover, Aristotle could hardly have thought of early Pythagoreans as maintaining a form of atomism, since whenever he speaks of fifth-century thinkers who "introduce" or teach or uphold "atomic magnitudes," he refers exclusively to the Ionian atomists (*Phys.* 187a2–3; *De caelo* 303a4–6; *De gen. et cor.* 315b26–317a1; *De an.* 445b18). Finally, the doxographic tradition knows nothing of unit-point atoms in early Pythagoreanism. On the contrary, it asserts that Ecphantus of Syracuse (late fifth century at the earliest) "was the first to declare that the Pythagorean units were corporeal" (*Aëtius* 1, 3, 19; 51A2 in DK). Fundamental recent studies of early Pythagorean doctrine by Kurt von Fritz ("Pythagoras," pp. 197ff. and pp. 225ff.) and Walter Burkert (pp. 30ff.) find no place for unit-point-atomism, and Burkert argues forcefully against it (pp. 37–38).

Thesis (3), that Pythagoreans held time and motion to be discontinuous, was pure conjecture and most implausible: so abstruse a theory as the quantization of time and motion could not have been seriously entertained until well after the much less daring speculation of the atomic constitution of matter had become thoroughly assimilated by the philosophical imagination—that is, well after Zeno.

Thesis (4) was the main attraction of the theory for Tannery and many others. They hoped to rehabilitate the logical force of Zeno's arguments by showing that their supposed sophisms were in fact acute criticisms of confused and misguided views held by Zeno's own contemporaries. One can understand how the Arrow and the Moving Blocks lent encouragement to this hope, for they were widely believed to be crushing objections to the discontinuity of time, space, and motion. But other Zenonian puzzles do not fit this pattern. Thus, an upholder of discontinuity would reject infinite divisibility on principle. Why then should he swallow it in the Race Course and the Achilles? In Fragment 3 why must he grant that between any two of his number atoms there must always be a third? [376] In Fragment 1 would he not be downright stupid to admit that an existent composed of such atoms would

be infinitely divisible? And if the argument of this fragment were meant to *rebut* an atomistic conception of reality, how could it have been misunderstood so grotesquely by the Ionian atomists who (if we may judge from Epicurus, discussed in the proof of [R], above), swallowing its fallacy whole, thought it a splendid argument for atomism?

Thesis (5) is patently false in view of the mathematical atomism professed by the unnamed opponents of the pseudo-Aristotelian work *De lineis insecabilibus* and the atomistic view of space and time to be found in Diodorus Cronus. In each case a Zenonian argument—the Race Course in the first (968a19ff.), the Arrow in the second (Sext., *Pyrrh. hyp.* 2, 245, and 3, 71; *Adv. math.* 10, 86–89)—is put to work for an atomistic view of extensive magnitude which, according to Tannery, Zeno's polemic had exterminated.

On the strength of thesis (6), Helmut Hasse and Heinrich Scholz (in *Die Grundlagenkrise der griechischen Mathematik*) went so far as to name Zeno "the man of destiny of ancient mathematics in the hour of its gravest crisis" (the discovery of irrational quantities), claiming that his "inexorable critique of the introduction of transfinite processes with infinitesimal elements" (allegedly exemplified in Antiphon's quadrature of the circle and Democritus' fragment on the cone—a generation *after* Zeno) brought Greek science back from "pseudo mathematics" to "the path of scientific rigor." (For a refutation of this fantasy, see van der Waerden, 151ff.) There is nothing in our sources that states or implies that any development in Greek mathematics (as distinct from philosophical opinions about mathematics) was due to Zeno's influence.

Influence on mathematics. When the Tannery hypothesis and its offshoots have been laid aside, it will not be necessary to go to the other extreme and deny Zeno any influence on the mathematicians. From the Aristotelian data it is clear that Zeno's puzzles had excited great interest: thus, in the *Topics* and *Physics* the Race Course is Aristotle's star example of a tough argument for a false conclusion (*Top.* 160b7–9, 172a8–10, and 179b20–21; *Phys.* 223a21–31, 239b10–26, and 263a4ff.). It is safe to assume that some of the people who worked on the paradoxes were mathematicians and that this sharpened their awareness of the logical traps in and around the concept of infinity. But from just this (which is all we have to go on) we cannot infer that "the subsequent course of Greek geometry was profoundly affected by the arguments of Zeno on motion" (Heath, *History of Greek Mathematics*, p. 272), still less that the mathematicians "realiz[ed] that Zeno's arguments on motion were fatal to infinitesimals" (ibid.). The first known move in Greek geometry that rigorously excluded infinitesimals, while no less rigorously asserting infinite divisibility, was made by Eudoxus in Euclid's *Elements*, Bk. V, Def 4. This asserts that when $A > \epsilon$, A has a definite ratio to ϵ if and only if there is an n such that $n \cdot \epsilon > A$ —the effect being, obviously, to admit only finite quantities to the theory of proportion and hence to the domain of metrically significant quantities. But this is to all appearances a purely intramathematical develop-

ment, whose motivation is to perfect the theory of proportion in its application to irrationals and to secure the foundations of "exhaustion" proofs (see Heath, *A History of Greek Mathematics*, pp. 326–29). It postdates Zeno by a century, and none of our sources connects it with him in any way. That Zeno influenced this development, "profoundly" or otherwise, remains a matter of guesswork.

Philosophical influences. We begin to approach firm ground when we turn to Zeno's influence on the philosophers. In discussing the third argument against plurality, whose originator, we admitted above, was probably Zeno, and also in his resolution of the deeper perplexity of the Race Course, Aristotle presents his own theory of the potential infinite as the answer. Since he does not offer any hint of a possible solution along alternative lines, it may well be that Zenonian paradoxes helped convince him that only by the denial of the actual infinite could infinite divisibility be freed from contradiction. Attested more definitely is Zeno's influence on the atomists; it was because "they gave in to the [line of] argument from dichotomy, that they postulated atomic magnitudes" (Aristotle, *Phys.* 187a2–3). Although Zeno is not named, Aristotle must be thinking principally of him, since he is the undoubted originator of this line of argument. This, and the fact that two such Zenonian arguments (the proof of [R] in the first argument against plurality and the third argument against plurality, above) are built by Epicurus into the foundations of his theory, suffices to show that Zeno was not taken as merely a spirit of contradiction by great fifth-century thinkers who were not sectaries of Elea. But on others, such as Anaxagoras, he made no dent at all, and even the atomists could have had no use for many of his arguments—for example, the best of his arguments against plurality, Fragment 3: their theory would deny both horns of the dilemma, affirming an actual infinity of atoms (and even of worlds) and giving no quarter to the assumption that between any two atoms there must be a third. His most positive contribution, and his only substantive one to our knowledge, seems to have been made within his own school. The incorporeality of being is never asserted by Parmenides, although his whole system cries out for such a doctrine; this we do find in Melissus: "If being is one [and nothing could be more certain for an Eleatic than that Being *is* one], it cannot have body" (Fr. 9; a statement which it seems we have no choice but to take at face value; for the contrary opinion, see, for example, Booth, "Did Melissus Believe in Incorporeal Being?" (61ff.)) But Zeno's book, written while he was still "a young man," must have preceded that of Melissus. Zeno must therefore be reckoned the first to make this doctrine explicit, as he undoubtedly does, in arguing, according to the reconstruction in the first argument against plurality, above, that whatever has size is divisible into parts and hence cannot be one, since by "size" here he could only have meant three-dimensional extension, and it is impossible to see how he could have denied this to Being without also denying it material bulk.

The service he rendered not to particular schools but to the world is that which made Aristotle name him "the inventor of dialectic." In the Milesians, Xenophanes, and Heraclitus there had been virtually no philosophical argument. This began with Parmenides. But in his poem its free movement is impeded by an alien medium, whose verse-form suits perfectly the seer proclaiming a spiritual [377] vision and very poorly the debater offering to engage all comers in logical combat. At this point Zeno breaks with his master to become the founder of Greek argumentative prose. Comparing his fragments with those of Parmenides, we see marked advances in technique. Fragment 3 is an all-but-perfect piece of logical exposition. The first argument against plurality, for all its unavoidable clumsiness of phrasing and logical syntax, is a remarkable composition, joining three distinct inferential sequences to spring a single dilemma. In these and apparently in all the other arguments, the philosophical paradox is put to work in a radically new way. Heraclitus had used it to signal with Delphic obliqueness new insights which elude direct statement and escape inferential controls (see his Fr. 93). Zeno made it serve a totally different function—that of dramatizing the fact that all-too-familiar beliefs may have implications which are fatal to the credibility of the implicands. In the whole history of philosophy, no better device has ever been found for sensitizing us to the possibility that commonplaces may conceal absurdities and hence to the need of reexamining even the best entrenched and most plausible assumptions. That Zeno himself got so few positive results by the use of this method is not surprising; he was hampered by the poverty of his conceptual and semantic tools. His archaic logic gave him no inkling of the role that wholly tacit premises play in determining his seemingly cogent conclusions. And he pursued his work not in the spirit of disinterested inquiry but only to enforce predetermined Parmenidean dogmas, defended but never tested by his arguments. He more than compensated for these and other defects by an uncanny instinct for philosophically important issues and an unsurpassed power to invent philosophically exciting dilemmas.

BIBLIOGRAPHY

- Baccou, R., *Histoire de la science grecque de Thales à Socrate*. Paris, 1951.
- Benacerraf, Paul, "Tasks, Super-Tasks, and the Modern Eleatics," *JP*, 59 (1962), 765ff.
- Benardete, José A., *Infinity. An Essay in Metaphysics*. Oxford, 1964.
- Bergson, Henri, *Evolution créatrice*. Paris, 1907. Translated by Arthur Mitchell as *Creative Evolution*. New York, 1911.
- Black, Max, *Problems of Analysis*. Ithaca, N.Y., 1954.
- Booth, N. B., "Zeno's Paradoxes," *JHS*, 77 (1957), 187–201.
- , "Did Melissus Believe in Incorporeal Being?" *AJP*, 79 (1958), 61–65.
- Boyer, C. B., *The Concepts of the Calculus*. New York, 1939.
- Broad, C. D., "Note on Achilles and the Tortoise," *Mind*, 22 (1913), 318–19.
- Brochard, Victor, *Etudes de philosophie ancienne et de philosophie moderne*. Paris, 1912.
- Burkert, Walter, *Weisheit und Wissenschaft. Erlanger Beiträge zur Sprach-Kunstwissenschaft* 10. Nuremberg, 1962.
- Burnet, John, *Early Greek Philosophy*, 4th ed. London, 1930.
- Calogero, Guido, *Studi sull'eleatismo*. Rome, 1932.
- Chappell, V. C., "Time and Zeno's Arrow," *JP*, 59 (1962), 197–213.
- Chihara, C. S., "On the Possibility of Completing an Infinite Process," *PR*, 74 (1965), (74) ff.
- Cornford, F. M., "Mysticism and Science in the Pythagorean Tradition," *CQ*, 16 (1922), 137ff., and 17 (1923), 1ff.
- , *Plato and Parmenides*. London, 1939. Translation, with introduction and running commentary, of Parmenides' *Way of Truth* and Plato's *Parmenides*.
- Enriques, Federico, and Santillana, Giorgio de, *Histoire de la pensée scientifique*, II. Paris, 1936.
- Frankel, Hermann, "Zeno of Elea's Attacks on Plurality," *AJP*, 63 (1942), 1–25, 193–206. Translated into German in *Wege und Formen frühgriechischen Denkens*. Munich, 1955. Pp. 198ff.
- Frege, Gottlob, *Die Grundlagen der Arithmetik*. Breslau, 1884. Translated by J. L. Austin as *The Foundations of Arithmetic*. Oxford, 1950.
- Fritz, Kurt von, review of Calogero's *Studi sull'eleatismo*. *Gnomon*, 14 (1938), 91ff.
- , "Pythagoras," in *RE*, Supp. Vol. 10. Stuttgart, 1963.
- Grünbaum, Adolf, "Relativity and the Atomicity of Becoming," *Review of Metaphysics*, 4 (1950), 143–86.
- , "A Consistent Conception of the Extended Linear Continuum as an Aggregate of Unextended Elements," *Philosophy of Science*, 19 (1952), 288ff.
- , "Messrs. Black and Taylor on Temporal Paradoxes," *Analysis*, 12 (1952), 144ff.
- , "Modern Science and Refutation of the Paradoxes of Zeno," *Scientific Monthly*, 81 (1955), 234–39.
- , *Philosophical Problems of Space and Time*. New York, 1963.
- , *Modern Science and Zeno's Paradoxes*. Middletown, Conn., 1967.
- Guthrie, W. K. C., *A History of Greek Philosophy*, I, *The Earlier Presocratics and the Pythagoreans*, Cambridge, 1962, II, *The Presocratic Tradition from Parmenides to Democritus*, Cambridge, 1965.
- Hasse, Helmut, and Scholz, Heinrich, *Die Grundlagenkrise der griechischen Mathematik*. Berlin, 1928.
- Heath, T. L., *A History of Greek Mathematics*, 2 vols. Oxford, 1921. Vol. 1.
- , *Mathematics in Aristotle*. Oxford, 1949.
- Heidel, W. A., "The Pythagoreans and Greek Mathematics," *AJP*, 61 (1940), 1ff.
- Koyré, Alexandre, *Etudes d'histoire de la pensée philosophique*. Paris, 1961.
- Lee, H. D. P., *Zeno of Elea*. Cambridge, 1936.
- Lee, H. N., "Are Zeno's Arguments Based on a Mistake?" *Mind*, 74 (October 1965), 563–90.
- Luria, Salomo, "Die Infinitesimallehre der antiken Atomisten," *Quellen und Studien zur Geschichte der Mathematik*, 2 (1932–33), Part B, 106–85.

- Mau, Jürgen, *Zum Problem des Infinitesimalen bei den antiken Atomisten*. Berlin, 1957.
- Owen, G. E. L., "Zeno and the Mathematicians." *PAS*, 58 (1957–58), 199–222.
- Raven, J. E., *Pythagoreans and Eleatics*. Cambridge, 1948.
- , "Melissus," "Pre-Parmenidean Pythagoreanism," and "Zeno," in G. S. Kirk and J. E. Raven, *The Presocratic Philosophers*. Cambridge, 1957.
- Renouvier, Charles, *Traité de logique générale et de logique formelle*, new ed. Paris, 1912. The first edition appeared in 1854.
- Robinson, Richard, *Plato's Earlier Dialectic*, 2nd ed. Oxford, 1953.
- Ross, W. D., *Aristotle's Physics*. Oxford, 1936.
- Russell, Bertrand, *Principles of Mathematics*. London, 1903.
- , *Our Knowledge of the External World*. London, 1914.
- , *A History of Western Philosophy*. New York, 1946.
- , "Mathematics and the Metaphysicians," in James R. Newman, ed., *The World of Mathematics*. New York, 1956. Vol. 2, pp. 1576–92. The date of Russell's essay is not given.
- Ryle, Gilbert, *Dilemmas*. Cambridge, 1954.
- Solmsen, Friedrich, *Aristotle's System of the Physical World*. Ithaca, N.Y., 1960.
- Szabó, Arpad, "The Transformation of Mathematics into Deductive Science and the Beginnings of Its Foundation on Definitions and Axioms." *Scripta Mathematica*, 27 (1964), 27ff. and 113ff.
- Tannery, Paul, "Le Concept scientifique du continu: Zenon d'Elée et Georg Cantor." *Revue philosophique de la France et de l'étranger*, 20 (1885), 385ff.
- , *La Géométrie grecque*. Paris, 1877.
- , *Pour l'histoire de la science hellène*. Paris, 1887.
- Taylor, Richard, "Mr. Black on Temporal Paradoxes." *Analysis*, 12 (1952), 38ff.
- Thomson, James, "Tasks and Super-tasks." *Analysis*, 15 (1954), 1–13.
- Untersteiner, Mario, *Zenone*. Florence, 1963.
- Vlastos, Gregory, review of Raven's *Pythagoreans and Eleatics*. *Gnomon*, 25 (1933), 29ff. (**1.180ff.).
- , review of Fränkel's *Wege und Formen frühgriechischen Denkens*. *Gnomon*, 31 (1959), 193ff. (**1.164ff.).
- , review of Kirk and Raven's *The Presocratic Philosophers*. *PR*, 68 (1959), 531ff.
- , "Zeno," in Walter Kaufmann, ed., *Philosophic Classics*. New York, 1961, pp. 27ff.
- , "A Note on Zeno's Arrow." *Phronesis*, 11 (1966), 3–18. (**1.205ff.).
- , "Zeno's Race Course." *JHP*, 4 (1966), 95–108. With appendix, "Zeno's Achilles" (**1.189ff.).
- Van der Waerden, B. L., "Zenon und die Grundlagenkrise der griechischen Mathematik." *Mathematische Annalen*, 117, No. 2 (1940), 141ff.
- Watling, James, "The Sum of an Infinite Series." *Analysis*, 13 (1953), 39ff.
- Weiss, Paul, *Reality*. Princeton, N.J., 1938.
- Weyl, Hermann, *Philosophy of Mathematics and Natural Science*. Princeton, N.J., 1949. Originally published in *Handbuch der Philosophie* (Munich and Berlin, 1927) under the title "Philosophie der Mathematik und Naturwissenschaft." Revised and augmented English edition based on a translation by Olaf Helmer.

- Whitehead, A. N., *Science and the Modern World*. New York, 1925.
- , *Process and Reality*. New York, 1929.
- Whitrow, J. G., *The Natural Philosophy of Time*. London, 1961.
- Zeller, Eduard, *Die Philosophie der Griechen*, 7th ed., Vol. 1, Part 1. Leipzig, 1923.
- Zeuthen, H.-G., *Geschichte der Mathematik im Altertum und Mittelalter*. Copenhagen, 1896.

PLATO'S TESTIMONY CONCERNING ZENO OF ELEA

IN THE OPENING paragraphs of Plato's *Parmenides* (126a–128e), we learn of a work by Zeno which could be read comfortably at a single sitting. As we know from the surviving fragments, it was full of extraordinarily compressed material. So we could hazard the guess that it could not have taken more than an hour or so to read, since the reading was to be a preliminary to extended discussion. Such a length would match that of the earliest works of scientific prose which have survived intact: the Hippocratic treatises. *On Ancient Medicine* is about 5,000 words; *On Airs, Waters, Places* about 6,800.¹ A work of even 5,000 words would have contained the originals of all of Zeno's arguments of which we know and many more besides. From the way the book is talked about here,² we get the impression that it contained the whole of Zeno's oeuvre.³ The references are to a single work written when Zeno was still "very young" (say, twenty or a little more). Zeno is made to say it had been "stolen" from him (i.e., put into circulation by unauthorized third parties) before he had made up his mind to publish. If he had put out other works thereafter, we would expect some reference to them to drive home his point that the pugnacious temper of that youthful work⁴ should not be thought to represent his present outlook. Diogenes Laertius (9, 26) speaks of *biblia*, but in a context which gives no indication that he is following a reliable

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¹ Other prose essays are even shorter. The pseudo-Xenophontic *Constitution of the Athenians* is about 3,600 words.

² The plural *grammatōn* in 127c3 and 127d3 has no significance: subsequent references to the same material (*toî sungrammati*, 128a6, *tou grammatos*, 128b8, etc.) turn without explanation to the singular form.

³ Socrates refers to the book as *ta Zēnonos grammata* (cf. Zeller [1923, 610n]). Simplicius too (*Phys.* 140, 28) speaks of Zeno's treatise in the singular (*ἐν αὐτῷ . . . τῷ τοῦ Ζήνωνος συγγράμματι*). Burnet's remark [1930, 311], "in the *Parmenides* Plato makes Zeno say that the work by which he is best known [my emphasis] was written in his youth . . ." is misleading; there is nothing in Plato's text to warrant the suggestion that Zeno had also other, less well known works.

⁴ διὰ τοιαύτην δὲ φιλονικίαν ὑπὸ νέου ὄντος ἐμοῦ ἐγράφη, 128d6–7.

source. The four titles listed by Suidas⁵ (a very late source, perhaps of the tenth century A.D.) inspire no confidence. [136]

If we could trust what Plato tells us here, we would know the following about Zeno:

(A) The first discourse⁶ in his book had been directed against the "hypothesis"⁷

⁵ One of them, *Pros philosophous*, has been singled out for favorable treatment by champions of the theory that Zeno's arguments were anti-Pythagorean polemic (e.g., Burnet [1930, 312]; Lee [1936, 8]); claiming that "in the fifth century *philosophos* had not yet its generalised meaning of 'philosopher' but meant Pythagorean," they found in the title "evidence that Zeno wrote attacking the Pythagoreans" (both quotations from Lee, *loc. cit.*). But that Zeno himself should have entitled a work of his *Pros philosophous* seems "extremely improbable if we date the work [as it is commonly agreed that we should] ca. 465 B.C." (Heidel [1940, 22]); the origin of the title is more likely to be Alexandrian. But even if the title were Zeno's own, the claim that by so entitling his work he must have been addressing Pythagorean philosophers turns on a premise which is demonstrably false: cf. the use of *philosophos* in such a text as Heraclitus B35 (if the injunction to those aspiring to become *philosophoi*—that they should be εὖ μάλα πολλῶν ἰσοτελεῖς—is addressed to those who are scorned for having attained mere *polumathie* in B40, its constituency would include a group diverse enough to be illustrated by Hesiod, Pythagoras, Xenophanes, and Hecataeus in the latter fragment); cf. also the use of *philosophōn* in Gorgias B11(13), and of *philosophiēn* in [Hippocrates] *On Anc. Med.* 20 (there is no allusion to Pythagoras or Pythagoreans in either of these texts, and in the latter *philosophiē* is obviously speculative physiology, illustrated by "Empedocles or others who have written *peri phuseōs*"). [All references to Presocratic fragments here and hereafter are by their numbering and text in DK, 6th ed.]

⁶ I take Plato to be using *logos* in our passage in a sense which is broad enough to cover any stretch of argumentative discourse regardless of whether this is

(a) as short as a single argument, or

(b) an extended stretch of argumentation containing several arguments,

and I assume that he is using it in sense (b) in the phrase τὴν πρώτην ὑπόθεσιν τοῦ πρώτου λόγου, 127d7, since otherwise τὴν πρώτην ὑπόθεσιν would be a senseless redundancy (we could hardly suppose that Plato wanted us to think of a single argument which had more than one hypothesis), but in sense (a) in τεκμήριον εἶναι ἕκαστον τῶν λόγων, ὥστε ἡγῆ τοσαῦτα τεκμήρια παρέχασθαι, ὅσοις περὶ λόγους γέγραφε; it must mean "argument" here, for each of the particular arguments would surely count as a *tekmērion* of the hypothesis (cf. the three arguments in *Rep.* 433b7–434c7 by which Socrates "proves" [*hothen tekmaïromai*, 433b5] his definition of *dikaiosunē*: the *tekmēria* ascribed to Parm. (128b1) are clearly the individual arguments (extremely short ones) reeled off in the course of the forty-nine verses that make up *Parmenides'* discourse on Being. At the other extreme, we have Diēs and Cornford who translate "argument" throughout our passage but think of these "arguments" as divided up into multiple sections called "hypotheses" (Diēs [1923, 17], Cornford [1939, 57]), ignoring the difficulty to which I allude above: Plato himself could hardly have thought of arguments each of which contained several hypotheses. Proclus is undoubtedly using *logos* in sense (a), not sense (b) (as misunderstood by Burnet, *loc. cit.*), when he remarks that there were forty *logoi* altogether in Zeno's book (*Comm. in Parm.*, 694, Cousin), he could not have meant it in sense (b): a figure several times 40 for the total number of arguments in Zeno's treatise would be too bloated to commend itself to his sober judgment.

⁷ This –the protasis of a conditional statement, not the whole conditional—is clearly the sense

that plurality exists.⁸ The argument had the logical form of a *reductio ad absurdum*: it assailed the hypothesis by purporting to demonstrate that it entails an outright contradiction.⁹

(B) All of the arguments in his book were meant to refute plurality (127e8–128a1).

(C) Zeno was a personal intimate (127a8–b6)¹⁰ and, in his book, a philosophical partisan of Parmenides (128a4–b5).

(D) Parmenides, in his arguments for monism, and Zeno, in his arguments against pluralism, were maintaining “virtually the same thing” (128a6–b6). [137]

(E) The real aim of Zeno’s book had been to expose the absurdity of the position of those who found Parmenides’ monism absurd (128c6–d6).¹¹

of *hypothesis* in 128d5–6, where each of the suppositions, “many things exist” and “[only] one thing exists,” is unambiguously denominated a *hypothesis*. This is also the sense of “hypothesis” in which Plato generally uses the term, clearly so in the rest of the *Parm.* (136a ff.), and demonstrably so in other dialogues (Crombie’s view [1963, 533] that the “hypothesis” in *Meno* 87b ff. is the conditional “if virtue is knowledge, then it is teachable,” rather than the protasis of that statement, is untenable; it was refuted by Cherniss and Friedländer in their critique of R. Robinson, who had taken this position in the first edition of his book but abandoned it in the second in response to their criticism. [Robinson 1953, 117–18, with references there to his critics]). In τὴν πρώτην ὑπόθεσιν τοῦ πρώτου λόγου (127d6–7) *hypothesis* is being used in an extended sense to mean not only the protasis of the conditional statement which formed the thesis of the argument, but the whole of the argument which refuted that protasis: Socrates would hardly be thought of asking Zeno to reread anything less than that.

⁸ Literally, “that many (things) exist” (*polla einaí*, 127e7, *polla esti*, 127e10, etc.). In the expanded form in which the hypothesis occurs in 127e1–2, εἰ πολλὰ ἐστὶ τὰ ὄντα, I take *ta onta* to be a Platonic addition which is not meant to be part of the quotation but to fill out *ei polla esti* in a way which adds nothing to its sense but suits better Plato’s taste in philosophical prose, (which explains why) he prefers to use this expanded form in his initial reference to the plurality thesis, turning to the sparer formulation thereafter. That the latter was the Zenonian original, we know from the form in which the hypothesis appears not only in B1 but also, and more importantly, in B3 (where we have the complete text): there *onta*, understood in the hypothesis *ei polla esti*, becomes explicit in the course of the argument and is mentioned in the conclusion, καὶ οὕτως ἀπειρα τὰ ὄντα ἐστί. Cf. also the hypothesis in *Mel.* B8(2), εἰ γὰρ ἦν πολλὰ, and B(8)6, εἰ πολλὰ εἴη.

⁹ It would be wrong to assume (as Burnet [1930, 313] seems to do) that all of the arguments had this form. Thus, in the first three arguments against motion, the absurdity which refutes the premise is not an explicit, but an implicit, contradiction: the absurdity results only from the fact that the conclusion contradicts a premise the reader brings to the argument, *sc.* that the stadium is traversed, that Achilles overtakes the tortoise, that the arrow moves.

¹⁰ His boy-love according to Plato, his adoptive son according to Diog. Laert. 9, 25 (but the latter, as Zeller surmised [1923, 609, note], is probably only the prudish effort of some later writer to put a better face on the all too plain sense of *paidika* in Plato).

¹¹ That this aim was not openly expressed is an unavoidable inference from Socrates’ charge that Zeno had tried to “fool” his readers (128a7), concealing his true intentions in the book. Though Zeno rejects the charge (128c2–5), neither does he say anything to imply that he had avowed positively his alliance with Parmenides anywhere in the book. had this been the case, Socrates’ charge could hardly have been made in the first place.

(F) The plurality thesis under attack in the book was the commonly held belief in denying that thesis, Zeno was going “against all that is said” (127e9–10).¹²

How much of this testimony can be trusted? In particular, *can it be trusted at (C)?*¹³ I italicize because our answer to this question is bound to be of the last importance for our interpretation of ancient reports of Zeno’s arguments and even for our interpretation of those fragments which have survived verbatim. For when we interpret these data, we cannot ignore Zeno’s intentions—particularly so when we confront inferences of his which look like patent fallacies to us. And an author’s intentions are notoriously hard to ascertain beyond reasonable doubt even in cases where his text has survived intact, as, e.g., in the Socratic dialogues, where scholars confronting a particular fallacy may still disagree sharply on whether or not Plato himself was aware of it and, if so, whether or not he wants us to credit his mouthpiece, Socrates, with the same awareness. In Zeno’s case the difficulty is magnified by the textual incompleteness of the most elaborate of his surviving arguments against plurality (the one which includes B1 and B2),¹⁴ by the extreme brevity and compression of the one argument against plurality where our text is, to all appearance, complete (B3), and by the fact that all of his other arguments

¹² That the book was addressed “to those who tried to ridicule [Parmenides] by showing that if one thing exists his argument will have many absurd and contradictory consequences” (128c) could mean (though it need not) that the book was provoked by some particular philosopher(s) who had criticized Parmenides in this way. If that were true, and if the book was written in Elea (as is likely), it would not follow, as Burnet and others have claimed, that the critics had been Pythagorean philosophers: Burnet does not tell how he knows that “the Pythagoreans are the only people who can have criticised the views of Parmenides there and at that date” [1930, 314]: were there no non-Pythagorean philosophers in Magna Graecia at that time? We know of Alcmaeon; and there were doubtless many others. Moreover, since there was good intercommunication between different parts of the Greek world (thus Heraclitus at Ephesus criticizes [B40, B129] Pythagoras in Croton), the critic or critics could have been anywhere in the greater Greek world. And if the book were a reply to critics, it would not, of course, be for their exclusive consumption. Anyhow, the surviving fragments do not contain a single word which would suggest that the views they combat are anything but those of common sense—common to all non-Eleatic philosophers and to nonphilosophers alike. (Cf. Vlastos, [1959b, 534, 1967c, 376–77] (**1.256–59).)

¹³ This is the crucial question, to be distinguished sharply from the question of whether or not we may accept Plato’s testimony at (B) and (E). As I shall argue in Section I below, we have good reason for accepting it at (C), while rejecting it at (B) and scaling down (E) accordingly (substituting *views* for *monism*).

¹⁴ Diametrically opposite interpretations of the import of this fragment turn very largely on whether or not we accept the correctness of Simplicius’ reading of the part of the argument he has preserved and the adequacy of his laconic summary of the part of the argument which he fails to quote (*in Phys.* 138, 33–139, 19), see, e.g., Vlastos [1959a, 197–98] (**1.170–72) following Frankel and others; *contra* Solmsen [1971, 130ff.] And since, as Solmsen has emphasized [1971, 126ff.], Simplicius is heavily influenced by Plato’s testimony on Zeno in the *Parmenides*, the question of whether or not we can trust what we get from Simplicius on this fragment will turn to some degree on whether or not we can trust Plato’s testimony (on this see the terminal paragraph of n. 17 below).

(with the exception of the Arrow, in my opinion: see Vlastos [1966b, 3ff.] (**1.205ff.)) reach us only in paraphrase. What we need to know as we work our way through this source-material is the following:

(1) (a) Was Zeno an honest thinker whose seriousness of purpose in searching for truth was on a par with that of Parmenides, Melissus, and of the other Presocratic philosophers? Or (b) was he a slippery character, a sophist, who would not be above resorting upon occasion to arguments which he knew, or suspected, to be fallacious?¹⁵ [138]

(2) (a) Was he committed to a positive, systematic, doctrine—that of the Parmenidean system? Or (b) was he a free-lance assayer of diverse theses and forms of argument, constructing conundrums and paradoxes with no thought of advancing the logical fortunes of any particular metaphysics, arguing on both sides of the dilemmas he sprung on his public and leaving the outcome unresolved?¹⁶

¹⁵ The question I am raising here has never been properly debated in the extensive literature on Zeno. That (a) is the correct answer has been the usual, but unargued, assumption. The decisive challenge to it came in Fränkel's fundamental study of the text of the original fragments [1942] which claimed to discover repeated resort to verbal legerdemain in Zeno's arguments against plurality and concluded with the following characterization of their author: "He was well aware of the gravity and profundity of his problems, and, nevertheless, while handling them, he often playfully, lustily, and defiantly deceives and mystifies his reader" (206). Elsewhere I argued that this characterization gets no sound support from the Zenonian texts (B1 and B2) on which Fränkel had sought to base it (see Vlastos [1959a, 195 96 (**1.167–69); 1971d, 121 and 129–31 (**1.222–23, 232–34)]); I am glad to see that Solmsen, in his important paper on Zeno [1971], to which I shall be making numerous references hereafter, agrees with me against Fränkel on this point (p. 117). Here I shall be arguing that neither is it supported by Plato's testimony, as Fränkel curiously thought it was. I say "curiously" because to substantiate the claim that Plato's *Parmenides* bears out the two-in-one Zeno—profound philosopher and verbal trickster—Fränkel gives us nothing more solid than references to the regrets voiced by the Platonic Zeno in 128d6–e3 for the *philonikia* and *philomimia* which animated his youthful work (236). But surely this is sheer *ignoratio elenchis*, pugnacious ardor in no way entails indulgence in light-fingered dialectics, Fränkel does not claim, and could not have plausibly claimed, that it does. He would surely have had to admit that there is not one word in Plato's *Parmenides* to lend color to the imputation of resort to genial fraud by Zeno in his arguments.

¹⁶ Here again the question has been largely ignored in the earlier literature. The consensus on (C) has been so broad and so assured that even Fränkel, the maverick who argued for (1b), took the truth of (2a) for granted. The dissidents have been few and far between and, prior to the appearance of Solmsen's fundamental paper in 1971, their dissent was expressed more in *obiter dicta* than in carefully reasoned conclusions. Thus all we get from Diels (normally an exceedingly thorough scholar) by way of putatively Platonic evidence for his sponsorship of (b) are *Phaedr.* 261c6–8 and *I Alc.*, 119a5–6 (to be discussed below in Section II and the Appendix respectively); after a mere citation of these two passages and a hasty reference to Eudemos *apud* "Simplicius, in *Phys.*, p. 98 et suiv." (*sic*; but he must mean to refer to pp. 97, 10ff. and 99, 10–12), he feels entitled to declare that the passage in *I Alc.* "indiquerait un Zénon sophiste de profession" and that the first "semblerait, à tout le moins, viser un Zénon qui manie la dialectique pour la dialectique elle-même," adding, "Et ce pourrait bien être, historiquement, la meilleure manière de comprendre Zénon" [1923, 16]. We get nothing better from Cornford [1939, 67–68] to back his view that in the *Parmenides* Plato regards Zeno's work "as an essay in *eristic* controversy, imply-

If Plato's testimony at (C) were to be accepted, the answer to question (2) would be settled at once: we would be assured that Zeno was an adherent of the Parmenidean system.¹⁷ [139] In that case we would have good reason for

me: that its author did not take his own arguments seriously." I have italicized the parts of the statement which are unsupported by argument and cannot get support from Plato's text, where Zeno is portrayed as controverting Parmenides' adversaries, and doing so most pugnaciously, but without any indication that he was doing so in an "eristic" temper and that he "did not take his own arguments seriously." For the further opinion that Plato thought Zeno "a mere sophist," Cornford, following Diels, refers us, more plausibly, but still without serious argument, to *Phaedr.* 261c. We do get considerably more by way of argument in von Fritz [1971, 42ff.], with much fuller use of the Eudemos fragment in Simplicius (on which, however, see under (b) in n. 57 below), to support the view that Zeno, though no sophist, is still only an aporetic arguer and brings help to Parmenides only by showing "that one gets into no smaller difficulties when one denies Parmenides' doctrine" (75, for further references to von Fritz and for a brief rebuttal of this construction of the Zenonian dialectic, see n. 52 below). But it is not until we come to Solmsen [1971, 140–41] that we get (in apparent independence of Diels and Cornford, to whose judgments on this point he makes no reference) a searching critique of the Platonic evidence which had led to the traditional acceptance of (a). Though I cannot accept Solmsen's conclusions, I believe that he has rendered a signal service to Zenonian scholarship by presenting a detailed, well-documented challenge to the traditional view, compelling a re-examination of data which had been read most uncritically in the past by many scholars, including myself.

¹⁷ It is well to note at this point—as Solmsen does not, this is a major lacuna in his argument—that we do get just this picture (vaguely, but unmistakably in its total effect) from both (I) Aristotle and (II) writers who reflect the doxographic tradition stemming from Theophrastus:

(I) Aristotle associates Zeno firmly with Parmenides in *Soph. el.* 182b22–26 when he alludes in passing to "the *logos* of Zeno and Parmenides" which, he says, has been refuted διὰ τὸ πολλαχῶς . . . λέγεσθαι τὸ ἐν καὶ τὸ ὄν. For in a much fuller passage (*Phys.* 185a20–186a3) he makes the multivocality of "being" and "unity" the base from which the whole critique of Eleatic monism must proceed. So when we see that in the *Soph. el.* passage he ascribes to Zeno, no less than to Parmenides, an argument which is to be refuted by the application of the same semantic insight, we have no good reason to doubt that he is thinking of both as adherents of the same *hēta panta* doctrine which in *Phys.* 185a22 he ascribes to Parmenides and Melissus, without naming Zeno in that context. Nor is there any good in supposing that in so coupling Zeno with Parmenides Aristotle is merely echoing what he had read in Plato's *Parmenides*: he makes no such allusion, direct or indirect; and that his knowledge of Zeno was independent of Plato is certain from his discussion of many Zenonian arguments to none of which is there any reference in the Platonic corpus (*Top.* 160b7–9; *Phys.* 209a23–25, 210b22–23, 239b5–240a18; 250a20–21, 263a4–6; *Met.* 1001b7–9).

(II) In the ambience of the doxographic tradition, we hear of Zeno as the "familiar" (*gnōrimos*) of Parmenides (Plut., *Adv. Colotem* 1126d, Sext., *Adv. math.* 7, 7, Alexander, *Metaph.* 227, 13–14); his "auditor" (*diakēkoe*, Diog. Laert., *Vitae philos.* 9, 25), his "pupil" (*mathētēs*) (Suidas on Zeno, scholiast on [Plato], *I Alc.*); his "successor" (Suidas on Parmenides). And cf. below n. 69 *sub fin.* The Theophrastean source epitomized in ps. Plut., *Strom.* 6 (immediately after the sketch of the Parmenidean philosophy) states: Ζ. δὲ ὁ Ἐλεάτης, ἴδιον μὲν οὐδὲν ἐξέθετο, διηπόρησεν δὲ περὶ τοῦτων ἐπὶ πλείον. διηπόρησεν here cannot mean that Zeno's *aporai* were hostile to Parmenides or even noncommittal in their doctrinal import. In Aristotle *Zēnon ēporei* in *Phys.* 210b22 and *hē Zēnonos aporia* in *ibid.* 209a23 introduce an argument which, if valid, would be fatal to the belief in space, and the puzzles concerning motion (*Phys.* 239b5ff.) are no less clearly meant to be destructive; and who but Parmenides and his clique would be made happy

also answering question (1) in favor of (a).¹⁸ For if Zeno were what Plato depicts in *Parm.* 127–28, we would expect him to observe the same respect for the truth which inspires his master's poem: it is not very likely that he

if both space and motion were argued out of existence? (Same implication in Plato's reference to the upshot of Zeno's arguments as *tautēn aporian*, *Parm.* 129e6.)

The import of the Aristotelian association of Zeno, no less than Melissus, with Parmenides is ignored by von Fritz [1971, 42–43] when he argues that Aristotle's designation of Zeno as the "inventor of dialectic" (frag. 1 Ross of Aristotle's *Soph.*, *apud* Diog. Laert. 8, 57 [cited in n. 103 below]) "nur bedeuten kann, dass er bewusst kontroverse Sätze aufstellte, die nach der einen wie nach der anderen Seite hin diskutiert werden kann."

This is the most precarious inference, in view of the fact that Aristotle uses the term *dialektikē* in a variety of senses (see Bonitz, *Index Aristotelicus* s.v.) and that the testimonium in Diogenes Laertius gives absolutely no indication of its Aristotelian context which might have enabled us to pin down the special sense Aristotle had in view when citing Zeno as the inventor of dialectic. There is one sense—argument which cannot produce scientific demonstration because its premises are only *endoxa* (cf. n. 105 below)—which would fit perfectly Plato's description of Zeno in (D) above. And there is still another sense—the one employed in Aristotle's famous remark that Plato's metaphysical views diverged from those of the Pythagoreans διὰ τὴν ἐν τοῖς λόγοις σκέψιν (οἱ γὰρ πρότεροι διαλεκτικῆς οὐ μετείχον), *Met.* 987b31–32—which could have been alternatively (perhaps even concurrently) the very one Aristotle had in view, and this too would comport with the Platonic description of Zeno. We know that Sextus so understood Aristotle, for he argued that Parmenides could not have been "unversed in dialectic since Aristotle regarded him familiar. Zeno, as the originator of dialectic" (*Adv. Math.* 7, 7). This is, of course, the picture in Simplicius, who finds Plato's account in the *Parmenides* so congenial that he parrots 128c6–d6 almost word for word (*Phys.* 134, 4–8), as has been noticed by Untersteiner [1963, 4–8] and Solmsen [1971, 126–27].

Because of Simplicius' verbal dependence on Plato in that passage, Solmsen holds (*loc. cit.*) that Simplicius' own conviction that Zeno was a disciple of Parmenides has no independent evidentiary value. This would indeed be the unavoidable conclusion if Simplicius had no direct access to non-Platonic sources. But the fact is that, in addition to his access to Theophrastean sources, Simplicius had in his possession substantial Zenonian texts. What he read in these texts must have glibed with Plato's representation of Zeno as a partisan of Parmenides—glibed so well that he did not feel it incumbent upon him to change a single word to mark even a shading of difference in his own understanding of this matter. To argue that this has no confirmatory value for the Platonic testimony, one must proceed on the assumption—which Solmsen in fact makes—that Simplicius' concurrence is due entirely to his subservience to Platonic authority. I see no good reason to grant that assumption. Certainly Simplicius' respect for Plato does not fall short of veneration; it would be bound to influence greatly his reading of Zeno's texts. But let us suppose that it had been the case, as Solmsen believes [1971, 128ff.], that the Zenonian texts in Simplicius' possession deployed arguments both *pro* and *con* Parmenidean theses—no more *pro* than *con*. Why must we believe that when confronting such a state of affairs, whose *prima facie* import would tell so strongly against the Platonic representation of Zeno as totally committed to the defense of the Parmenidean position, Simplicius would have simply disregarded the textual evidence, without so much as a sentence to explain away the discrepancy between what he read in Plato and what he found in the text before him? (And cf. below, n. 35 *sub fin.*) [140]

¹⁸ Provided, of course, that on this point our conclusions from the Platonic testimony agreed with conclusions drawn from our analysis of Zeno's reasoning in preserved fragments. I have referred in n. 15 above to the (strongly positive) results of my study of those portions of the argument against plurality which are cited verbatim by Simplicius (B1, B2). No weight whatever

would have used sophistical logic to advance his master's sacred *alētheia*.¹⁹ To be sure, no more than probability may be claimed for this conclusion: we cannot rule out altogether the possibility that an Eleatic might have resorted, in desperation, to fallacious arguments to startle his readers—to jar them out of the stolid dogmatism which Parmenides' own austere logical discourse had failed to shake.²⁰ If we may trust Plato's testimony, we would be assured that he, at any rate, gives no quarter to such a suggestion. This is clear in the language he uses when his Socrates compares Zeno's arguments with those of Parmenides: the latter τεκμήρια παρέχ[ει] καλῶς τε καὶ εὖ for his monistic thesis, while the former τεκμήρια . . . πάμπολλα καὶ παμμεγέθη παρέχεται in refutation of the converse of that thesis (128b1–3). Socrates could hardly have been made to sum up in Parmenides' presence the two ventures in this way if he had meant to insinuate a contrast between chaste veracity in the one case and sophistical trickery in the other. There is not the remotest suggestion of such a thing in the description of Zeno's arguments as *pammegethē*: nothing here, so far as I can see, but an expression of admiration for the forcefulness of the Zenonian dialectic.²¹

Let me then review the considerations on the strength of which the acceptability of Plato's representation of Zeno at (C) will have to be decided. We may start from the fact that Plato's is our earliest,²² as well as our fullest,

could be attached to the inference which Cornford drew (see n. 16 above) from references in *Parm.* 128d–e to the contentious spirit (cf. n. 4 above) in which the youthful Zeno had composed his book: strong polemical animus (*philonikia*) would be quite in line with seriousness of intent, would indeed be normal in a young man engaged in a counter-attack on a revered master's adversaries.

¹⁹ Sacred, the "tremorless heart of well-persuading Truth" (B1, 29 for the text see Mourelatos [1970, 154], with references to Deichgräber and Jameson) is presented in the form of a religious revelation.

²⁰ But I should emphasize that I consider this only an abstract possibility. I know of no example of such tactics in contemporary, or near-contemporary, literature. Thus I do not believe that Socrates uses such tactics, even when he is most provocative, as, notoriously, in the *Hippias Minor* (there he does not conclude that the good man is the *hekōn hamartanōn* but that he *would be*, εἴπερ τις ἔστιν οὗτος [376b]).

²¹ Calogero [1932, 91n.1] takes *kalos te kai eu*, said of Parmenides' arguments, to mean that they are "honest" and are to be contrasted in this respect with the (dishonest?) *pampolla kai panmmegethē* arguments of Zeno. How he gets this sense out of the text remains a mystery, unless he is reaching back to *exapatēn* in 128a7, which would be surely arbitrary, since the *apatē* there refers all too clearly to Zeno's supposed intention to say "something different" from Parmenides, without the slightest implication, so far as I can see, that Zeno used dishonest arguments to implement that intention.

²² The only report of an earlier testimony is the following in Diog. Laert. (8, 56)

Alcidas in his physical treatise (*en tōi phusikōi*) says at this same time Zeno and Empedocles heard Parmenides but afterwards left him, and that, while Zeno pursued philosophy on his own (*kai' idian philosophēsai*), Empedocles heard Anaxagoras and Pythagoras, emulating the latter's dignity of life and bearing, and the former's natural philosophy.

testimony about Zeno's relation to [141] Parmenides, and that Plato is expressing himself in this passage not in vague generalities but in direct and circumstantial references to the form and content of Zeno's book. And it so happens that the one thesis of the book which Plato reports here, εἰ πολλά ἔστι τὰ ὄντα, ὥς ἄρα δεῖ αὐτὰ ὅμοια τε εἶναι καὶ ἀνόμοια, can be checked against original material in Simplicius and found to agree so closely with the latter that any doubt of its accuracy would be idle: there can be no doubt that the essential part of the protasis,²³ εἰ πολλά ἔστι τὰ ὄντα, is a verbatim quotation; as for the apodosis, it is identical in logical form with that of the hypotheses in B1 and B3: the sentence-frame "are—and not—" recurs in all three, the only difference being in the words that fill the blanks, "alike" in the present text, "so small as to have no magnitude" in B1, "as many as they are" [i.e., finitely many] in B3. And since we know that *homoion* is a predicate which figures prominently in Presocratic philosophizing,²⁴ we have every reason to think that Plato is reproducing as accurately as could be expected²⁵ a sentence in Zeno's book which must have read, εἰ πολλά ἔστι, ἀνάγκη αὐτὰ ὅμοιά τε εἶναι καὶ ἀνόμοια.²⁶

When an author refers so specifically to a well-known book and quotes from it with this degree of accuracy, we may reasonably infer that he is speaking from firsthand knowledge.²⁷ And since there is no good reason to think

The allegation that Empedocles "heard" Pythagoras (near the middle of the fifth century!) suffices to discredit the historical reliability of this testimonium. However, even if it were fully reliable, it would still tell us nothing about Zeno's doctrine, unless we take *idian philosophēσαι* with Hicks (in his translation of Diog. Laert., vol. 2 [London, 1931]) to mean "framed his own system." Though this rendering is apparently approved by some scholars (Solmsen [1971, 137] seems to be reading the text in the same way), it is surely mistaken: in *kat' idian philosophēσαι* Zeno is being contrasted with Empedocles, who is represented as remaining in *statu pupillari* with new teachers, Anaxagoras and Pythagoras, while he (Zeno) pursued philosophy by himself, not under a master.

²³ I.e., the first three words, the last two being a Platonic addition which adds nothing material to the source of the phrase: cf. n. 8 above.

²⁴ Cf. the Word Index in DK s.v. *homoios*, noting particularly occurrences in Parmenides and Melissus.

²⁵ Given the fact that he is not undertaking to quote verbatim throughout: cf. the following note.

²⁶ I omit the *hōs*: it is only a feature of the indirect discourse employed by Socrates. For *dei* I substitute *anankē*, for this is the logical connective used by Zeno in B1 and B3 (though *dei* is not impossible: Melissus uses it—though exceptionally—in B9).

²⁷ Epitomes of the teachings of Presocratic philosophers, containing occasionally references to their works and snippets of (more or less) accurate quotations from them became common in the Hellenistic and Greco-Roman periods. The fountainhead of these works (and, in all probability, the first work of its kind) was Theophrastus' *Doctrines of the Physical Philosophers*. It would be arbitrary to assume that any such work was in circulation when Plato was composing the *Parmenides* (in the late seventies or early sixties of the fourth century), so that Plato's knowledge of Zeno's book might be derived from such a secondary or tertiary source.

that when Plato had got hold of Zeno's book he would have read only its first few lines, we would be justified in inferring, further, that his characterization of Zeno at (C) had good foundation in the book. It is fair to say that the overwhelming majority of scholars have proceeded on the assumption that this conclusion is correct. In so doing they have ignored two grounds on which its correctness could—and in fact has been—challenged.

(I) Plato's testimony at (B)²⁸ could be thought to undermine the credibility of his testimony at (C), since (B) contradicts what we know about Zeno's arguments from other sources.²⁹

(II) Plato's characterization of the relation of Zeno to Parmenides at (C) could be thought to be in conflict with the allusion to Zeno in the *Phaedrus*.³⁰

I want to argue that neither (I) nor (II) give us good grounds for doubting the characterization of Zeno at (C). In an Appendix I shall argue that neither does the remark about Zeno in *I Alc.* 119a.³¹

I. QUESTIONS ABOUT *PARMENIDES* 127e8–128b

This is the crucial segment of Plato's testimony in the *Parmenides*. Let me quote it in full: [142]

Is the intention of your arguments (δ βούλονταί σου οἱ λόγοι)—to vindicate, against all that is [commonly] said, that plurality does not exist (ὥς οὐ πολλά ἔστι)? And you think that each of your arguments is a proof of just that, so that you believe (*hēgei*) you have produced as many proofs [of the thesis] that plurality does not exist as are the arguments you have composed? Is this what you mean (*houtō legeis*), or am I understanding you wrongly?

"No," said Zeno. "You have grasped very well what the whole of my essay is driving at." (127e7–128a3)

What exactly is Plato telling us here? Is it

(1) that the plurality thesis was *the explicit refutation* of each of the arguments in Zeno's book?

or only

²⁸ Also, to some extent, at (E), which agrees with (B), in mentioning only Parmenides' motion as the doctrine which "in truth" (*to ge alēthes*) Zeno defended by his counterattack, but does not go so far as to say (or directly imply) that all of Zeno's arguments were directed to the proof of just this doctrine.

²⁹ Solmsen has so argued: cf. n. 16 above.

³⁰ Cf. n. 16 above.

³¹ *Pace* Diēs, cited in n. 16 above.

(2) that to achieve the refutation of that thesis was Zeno's intention in each of those arguments?

To summarize the testimony, as I have done above, in the form of

(B) All of the arguments in Zeno's book were meant to refute the plurality thesis, is, clearly, to opt for (2), whose difference from (1) is substantial, since (2) could very well be true while (1) was false. For suppose there were any number of arguments in the book whose refutands were *A* or *B* or *C*, none of these mentioning the plurality thesis, *P*. Even so it would be entirely possible for (2) to be true, provided only that Zeno believed that not-*A* implied not-*P* and that so did not-*B* and not-*C*, and that Zeno had produced his refutations of *A* and *B* and *C* with the intention that the reader would draw for himself the conclusion that *P* was thereby refuted three times over. Once sensitized to this difference between (1) and (2), we should have no difficulty in satisfying ourselves that it is not (1), but (2), i.e., (B) that Plato means to be telling us here.

For it is evident on inspection that (2) *is all he says*. Socrates is not asking Zeno whether or not each of his many arguments *states* that it refutes the plurality thesis but only whether or not Zeno *thinks* (*oiei*) or *believes* (*hēgei*) that each of those arguments does so. Nor is more than this implied in Socrates' subsequent remark that Zeno "denies that many things exist and . . . adduces very many and very powerful proofs" [of this] (128b1–3). To say that at an argument has been adduced as a proof of not-*P* is not of itself to imply that *P* is the explicit refutand of that argument: if we happen to think that the arguer believes that his refutand implies not-*P*, we may still wish to say that the argument has been adduced as a proof not-*P*, even if there has been no mention of *P*. So all we can get out of the dialogue between Socrates and Zeno is (2), not (1), i.e., only the allegation, made by Socrates and admitted by Zeno, that Zeno believed that all of his arguments refuted the plurality thesis and that he had produced all of them for the purpose of achieving its refutation.

Now to say that Zeno believed that

(3) in each of his arguments the conclusion, if valid, refutes the plurality thesis is, obviously, not to say that (3) is true or that Plato believed that (3) is true—which is just as well, for a little reflection will show that (3) is a very dubious article and, further, that there is no good reason to think that Plato himself thought (3) true. Thus, in the case of Zeno's arguments against motion, though it may reasonably be thought that motion implies plurality (i.e., that to have any motion at all, we must have at least two things in existence whose relative distance is changing),³² it does not look as though the converse [143]

³² This conception of motion is conspicuously displayed in Zeno's paradox of the "Moving Blocks": see, e.g., Vlastos [1967c, 375 (**1.254–55)]

were also true: what is there to stop us, for instance, from conceiving of a state of affairs in which a multitude of distinct objects remain motionless throughout eternity? Only if we take the objects envisaged in the plurality thesis to be those of the familiar world of sense-experience, only then would it be plausible to hold that, e.g., to refute the belief that a runner can reach the end of his course or that an arrow can fly would be tantamount to demolishing the whole structure of our beliefs about the world, and *thereby* destroying the plurality thesis. And if we then ask if we are compelled to believe that Plato would think (3) true, here again the answer must be in the negative. Thus if Plato were thinking not of physical objects but of his own Ideas he would certainly hold that, though plural, they are the very acme of motionlessness;³³ so how could their plurality be impugned, how could it be touched at all, if it were demonstrated that no arrow flies, that no race-course is traversed? Plato could hardly fail to recognize this, and what he says in the sequel suggests that he does recognize it.³⁴ He could do this while holding that Zeno, for his part, did believe in the truth of (3). For Plato would find it very natural to believe that Zeno, who had not even dreamed of the strange new world of incorporeal, super-sensible Forms, and had thought of plurality only as an attribute of corporeal sensibles, would indeed hold that in refuting motion he was refuting plurality by destroying the only possible world in which plurality could exist.

We can now face up to the question of whether or not we have any independent reason to think that Plato's allegation at (2) above—i.e., his testimony at (B)—is true. And the answer is, surely, that we have none. Rummaging through the whole of our source-material, we find nothing to incline us to agree with Plato that the refutation of plurality was *the* intention of Zeno's arguments.³⁵ We find nothing in this mass of evidence—nothing except Plato's say-so in our present passage—to persuade us that, for example, Zeno

³³ Cf. Vlastos [1973, 276–78 and nn.]

³⁴ He makes Socrates argue [128e ff.] that Zeno's argument would not be valid against Ideas, even if they were valid against sensible instances of Ideas

³⁵ Simplicius' concurrence on this point (e.g., at *Phys.* 139, 5–7 and 141, 10–11) is worthless for this purpose. For we know that his own Neoplatonic faith would itself have predisposed him to a similarly tendentious reading of Parmenides. He, too, for reasons of his own, would exalt unity as the all-important attribute of Parmenidean Being—so much so that the phrase *to hen on* comes to be used quasi-nominatively in his own writings as a referring expression for Parmenides' conception of Being (for a good example, see his triple use of the phrase within a few lines at *Phys.* 142, 30–143, 1). Having thus the strongest inclination to make antipluralism the thrust of Zeno's polemic against Parmenides' detractors, Simplicius' acquiescing in Plato's testimony on this point could hardly yield confirmation of it. Given two testimonies, both infected by the same prejudice, the later of the two could hardly strengthen the earlier. Solmsen (1971, 126–28) has rightly emphasized all this, calling attention to Simplicius' verbatim reproduction of several phrases from Plato's text. I agree with Solmsen completely on this point, *pace* my disagreement with him in n. 17 above, which concerns a very different point, *sc.* Simplicius' corroboration of Plato's testimony at (C), which could be valuable, while his corroboration of Plato's testimony at (B) was worthless—a possibility which Solmsen failed to consider

wanted to refute motion only as a means of refuting plurality. If Zeno had wanted to subordinate one of these two objectives to the other, why should he not have rather preferred the converse—to refute plurality as a means to refuting motion? The latter would have been fully as useful for the purpose of backing Parmenides and routing his detractors. We can see for ourselves, from our own reading of Parmenides' poem, that changelessness is as essential an attribute of Parmenidean Being as is its unity.³⁶ So if Zeno could banish [144] motion from the universe by force of argument, the aid he would bring Parmenides would be direct, immediate, and decisive. What is it then that makes Plato so sure that a refutation of motion would have to be converted into a refutation of plurality in order to aid Parmenides? So far as we can see, it is nothing more than Plato's own assumption that to establish the unity of Being had been Parmenides' all-engrossing concern.³⁷ This assumption we know to be false. Having Parmenides' very words in our hands, we can see for ourselves that Plato is misrepresenting him at this point. For though unity is most certainly one of the essential attributes of Being in the Poem,³⁸ it is no more than one of these, and by no means the one which matters the most to

³⁶ It is said to be *atremes* (B8, 4) and *akinēton* (B8, 26 and 38). The sense in which *kinēsis* is denied of Being, is of course, that of *change* in the broadest possible sense, which would include (a) "generation" and "destruction" (Aristotle's "substantial change"), (b) locomotion, and (c) qualitative change. The assertion that Being is *akinēton* in v. 26 starts with the denial of change in sense (a) in v. 27, which had been proved already at great length (verses 6–21) and proceeds to its denial in sense (b) in verses 29–30. There is specific mention of *topon allassein* in v. 30. To prove that *topon allassein* entails absurdities would be as direct and effective a way of coming to Parmenides' aid as would be any of Zeno's arguments against plurality.

³⁷ In our passage Plato goes so far as to suggest that this had been Parmenides' only objective: he puts Parmenides' aim to prove the unity of Being on a par with Zeno's aim to disprove the plurality thesis (128a8–b3), having previously (127e10–128a1) claimed that this had been Zeno's only aim, and then proceeding to say (128b3–5) that the upshot of the two works was that Parmenides and Zeno were saying virtually the same thing.

³⁸ It is asserted twice within the first six lines of the account of Being in the Poem, each of the two assertions pertaining to distinct senses of *unity*, both of which were regarded essential components of the term in classical philosophy:

(1) In B8, 4, Being is said to be *oulon monogenes* (for a defence of this reading, now widely accepted, see Tarán [1965, 88–93]; for the sense of *monogenes*, "'alone of its kind,' 'sui generis,' hence unique," see Kahn [1960, 157n.1]). Here Parmenides asserts the claim that Being is the only thing in existence, which he proceeds to demonstrate at a later stage of the argument—B8, 37–38 where Parmenides argues that "nothing but Being exists or will exist," as a conclusion from the propositions (previously established) that it is "whole [i.e., complete] and changeless" (*oulon akinēton t'*). *Uniqueness* is so common a sense of *unity* in classical philosophy that "one" is ordinarily used as an ellipsis for "just one." See, e.g., the flock of passages in Plato where "one Form" is used to mean "just one Form": Vlastos [1973, 355–56], note that at *Rep.* 597 "one only" (*mian monon*) in C3 replaces simply and without explanation "one" (*mia*) in B5, and note too how Plato passes (from) *hen* to *pan einai* to *hen . . . monon einai* for the identical Parmenidean doctrine in *Soph.* 244B6–10. And cf. Melissus' shift from his ordinary use of *ἐν tout' court* (B5; B6; B7(1) and (2); B9) to *hen monon* in B8(1), simply for greater emphasis, without change of meaning-content.

(2) In B8, 6 Being is said to be *hen, suneches*. Here, as Solmsen points out [1971, 120], the

Parmenides. The one on which he seems to put by far the greatest stock³⁹ is immutability: to the proof of the proposition that [145] Being is everlasting (*agenēton* and *anōlethron*)⁴⁰ and of the closely related one that it is *akinēton*⁴¹ he devotes nearly half of his disquisition on Being—23 verses out of 49 all told—while he gives only 7 to the proof of its unity. What is more, everlastingness is the only attribute of Being which is proved directly from the foundational Axiom of the system,⁴² while the proof of unity is derived from derivatives of that Axiom.⁴³

emphasis falls on the internal unity of Being—its indivisibility, which follows from the absence of differentiations or divisions within it. When he comes to prove this property (B8, 23)

39. Parmenides refers to it only by *suneches* (v. 25) and *ou diameiton* (v. 23), inferring this from its homogeneity (*ἐπεὶ πᾶν ἔστιν ὁμοίον*, v. 22) which he explains in the next two lines (*οὐδὲ τι τῇ μᾶλλον . . . οὐδὲ τι χειρότερον . . .*). This is the sense of *unity* which empowers Melissus to reason that if something has "parts" (*maria*) it cannot be *one* (B9), and Plato (to reason) that "what is truly one must be said to be absolutely without parts" (*Soph.* 245a8–9; and cf. *Parm.* 137c: if Being is one, it cannot have parts).

This dual sense of "unity" does not seem to have been clearly grasped in some of the scholarly comment on Parmenides, else it would have been realized that Parmenides has two proofs for the unity of Being—not just the one in verses 37–38, as maintained by Tarán [1965, 190], nor only the one in verses 22–26, as maintained by Owen [1960, 58–59], and the debate as to which of the two is the proof of unity in the Poem would have been pointless. I am glad to see that this is no longer at issue in the most recent contribution to the discussion (Stokes [1971, 134–44]), where the dual meaning of "unity" is duly recognized ("the oneness of Being, in that it is unique of its kind . . . and continuous," 134).

It may be worth pointing out that while Plato and Aristotle take for granted the dual sense of the unity of Being in Parmenides, they never bring this assumption into the open, never juxtapose the two senses it has for Parmenides, and in their comments on him do not keep the two senses distinct, signposting the change when they shift from one to the other. Thus Aristotle (followed by Theophrastus and Eudemus *apud* Simplicius, *Phys.* 115, 10–14) explains the unity of Being in Parmenides as its uniqueness in *Met.* 986b28–30, while in *Phys.* 185b7–34 its indivisibility is what he has in view. As for Plato, his critique of Parmenidean monism in *Soph.* 224b ff. starts by attacking its uniqueness (i.e., the assertion *hen . . . monon einai*, 244b9–10) but then (244c14ff.) proceeds to attack its indivisibility, arguing that to *alēthōs hen* must be *ameres pantelōs* (245a8–9, cited above).

⁴⁰ I resort to this vague expression for want of means of stating the point at issue more exactly. we are dealing with difference of importance between predicates all of which purport to be essential and to follow by inexorable logic from the premise of the system (its "Axiom," I shall call it) — that Not-being is unstateable and unthinkable. The difference in importance between these predicates is marked first and foremost by differential allocation of space to the proofs of immutability, but also by the logical priority of the proof of it is particular attribute over that of others. Immutability is proved first and is derived directly from the Axiom at verses 8–9 and again at verse 17, while both arms of the proof of unity come much later, and neither of them derives its predicate directly from the Axiom).

⁴¹ Verses 6–21.

⁴² Verses 26–31.

⁴³ Cf. n. 39 above. The Axiom introduced in the methodological preamble (the doctrine of the Two Ways), is recalled twice (verses 8–9 and v. 17) to anchor the proof of the everlastingness of Being.

⁴⁴ See above (1) and (2) in n. 38.

Is it shocking, is it even surprising, that Plato should put out so tendentious an account of the work of two predecessors? Only the most naive and inexperienced reader of the Greek philosophers would find it so. As every scholar in this area knows all too well, Aristotle does far worse things to philosophers he discusses, and so does Plato upon occasion.⁴⁴ The order of misrepresentation in the present case is a relatively low one. It does not involve the false imputation of a substantive doctrine to Parmenides or Zeno: there is no falsehood in saying that Parmenides was a monist⁴⁵ [146] and Zeno an antiplural-

⁴⁴ One example of each: Aristotle contrasts Melissus with Parmenides by saying that while Being is for Parmenides "that which is one by definition," for Melissus it is "that which is materially one" (Π. μὲν εἶχε τοῦ κατὰ τὸν λόγον ἑνὸς ἄπτεσθαι, Μ. δὲ τοῦ κατὰ τὴν ὕλην, *Met.* 968b19–21). Yet we know from Melissus' own words that, so far from holding that Being is "materially one," the philosopher undertook to prove that it is incorporeal: he offers a formal refutation of the thesis that Being has *sōma* (B9).

In *Theaet.* 152e Plato says that "almost all the wise except Parmenides" would agree that "nothing ever is—[whatever is] is always [in a state of] becoming" (ἔστι μὲν γὰρ οὐδέποτε οὐδέν, ἀεὶ δὲ γίγνεται), and cites Empedocles (in the same breath with Protagoras and Heraclitus!) as one who would agree. Yet we know that Empedocles endowed his four "roots" with Parmenidean Being for which there can be neither generation nor destruction, but only "mixing and unmixing." (See Empedocles B8, and also his B17, noting the force of *akinētoi* in v. 13 and of *ēnekes atēn homōia* in verse 35).

If one is puzzled that these great thinkers should be guilty of misrepresentations which even third-rate critics can see through, one need only recall that neither Plato nor Aristotle give any sign of having reflected on the principles which should guide philosophers in imputing beliefs and assumptions to one another, and in particular seem unaware that the following canon of imputation is illicit.

If A is convinced that *p* & *q* imply *r*, then A may impute acceptance of *r* to B whom A knows to accept *p*, even if A has no evidence that *q*, which is acceptable to A, is also acceptable to B.

In both of the above examples, our philosophers act as though they are at liberty to follow this principle

EXAMPLE 1:

p is "Being is infinite" (prominent Melissean Doctrine)

q is "if *x* is infinite, then *x* is material" (firm Aristotelian doctrine, totally foreign to Melissus)

r is "Being is material" (imputed to Melissus by Aristotle in accordance with the above canon, since it follows directly from *p* & *q*)

EXAMPLE 2:

p is "the four elements (and *a fortiori* all compounds thereof, hence all particular existents) are sensible and corporeal" (obviously true for Empedocles, since his elements are earth, water, air, fire)

q is "whatever is sensible and corporeal is always in a state of becoming, never in a state of being" (firm Platonic doctrine: cf. *Tim.* 27b6–c2, noting especially the reasoning in the closing lines)

r is "all particular existents are in a state of becoming, never in a state of being" (immediate inference from *p* and *q*, imputed to Empedocles by Plato in accordance with the same canon).

⁴⁵ I see no justification for the claim that "Plato misrepresents Parmenides' doctrine when he

ist.⁴⁶ The sum and substance of Plato's fault is that he foists on each of them his own sense of the importance of the unity of Being relatively to its other attributes. Having reached this conviction himself at a certain stage of his own philosophical development,⁴⁷ he does not scruple to project it on other philosophers, Parmenides and Zeno among them. This is the extent of his error.⁴⁸

describes it as *hen ta panta* (Tarán [1965, 270].) This particular formula does not, of course, occur in Parmenides' poem. But since it is said there that Being is "unique" and that "nothing but Being exists" (see above, n. 38, (1)), it follows tautologically that Parmenides holds that *hen esti*, *Parm.* 128d1 ("[only] one thing exists"—not, as in Cornford's translation, "there is a One," as though Plato had written *hen ti esti*, nor yet as in Solmsen's [1969], "the One is," as if Plato had written to *hen esti*). For the justification of the parenthetical expansion in my translation, see above, n. 38, (1) *sub fin.*, noting especially the references to Melissus, who uses the identical formula in B5 and B6, *hen eîē*, which Plato uses here for Parmenides). And since Plato substitutes *hen esti* in 128d1 for the formula *hen einai to pan* ("the all is one thing") he had used for Parmenides' thesis a few lines earlier (128a8–b1), it is clear that Plato takes the formulae to be strictly equivalent, as indeed they are. If only one thing exists, it follows immediately that whatever does exist (or all that exists, "the all") is identical with that one thing. So it would be arbitrary to suppose that the variant formulae by which Plato expresses Parmenidean monism in *Theaet.* 180e, *hen . . . panta einai*, or in *Soph.* 252d5–6, ὡς ἑνὸς ὄντος τῶν πάντων καλουμένων, involve any misrepresentation whatever of Parmenidean doctrine (the plural form, *panta*, in these two phrases could not be meant to carry existential significance, note the implied demurer in *kaloumenōn* in the last citation, what is so called is in fact one, according to Parmenides, and note the alternative use of the singular *hen to pan*, in *Soph.* 244b [quoted also above, n. 38]). Nor could I concur with Mourelatos' view [1970, 130ff.] that we should distinguish "holistic" from "nonholistic" monism, ascribing only the latter to Parmenides, I fail to grasp the validity of such a distinction for Parmenides: if, as Mourelatos says, "the formula of nonholistic monism is that of uniqueness," and that of "holistic" monism is "all things are one," then the two would be logically equivalent for Parmenides unless we were to read ontological import into the plural of *panta*, and why should we do that? Would anyone read ontological import into the plural *mē eonta* in B7, I? Certainly Plato does not do so when he represents Parmenides as holding *hen panta einai*, else he would be charging the "great" (*Soph.* 237a) Parmenides with planting an explicit contradiction into the very enunciation of his doctrine.

⁴⁶ There would be, of course, if Zeno had argued not only against plurality (as he does in the "hypothesis" of the argument reported by Plato and in that of B1 and B3) but also against unity which, in my opinion, he does not, the allegation that Plato represents him as so arguing in *Phdr.* 261c will be examined below.

⁴⁷ We see this most clearly expressed in the *Sophist*: when he winds up his critique of Parmenides' interdict on Not-being (237a–241d) and proceeds to investigate the positive conception of being in antecedent philosophizing (242e ff.), the whole discussion is focused on the question, "Is Being one, or many, or one-and-many?" The Eleatic doctrine is immediately identified with the "One" answer (ὡς ἑνὸς ὄντος τῶν πάντων καλουμένων, 242d5–6) and the critique of Parmenides is given over to the refutation of this one thesis (244b ff.). Plato must have reached that conviction already in the *Theaetetus*, else he would not have dragged in the monism of Parmenides there, in a context where it does not belong (the topic under discussion is fluxism, 153e ff.), and placed it ahead of immutabilism in the epitome of Eleatic doctrine he gives in 180e1–4. By assuming that he had reached this view already in the *Parmenides*, we can account for the misplaced accent on this part of Parmenides' doctrine in the *Theaetetus*.

⁴⁸ Error we are compelled to reckon it, since we cannot explain away its departure from the truth as a deliberate fictionalizing of the figures of Parmenides and Zeno for Plato's own dramatic purposes in this dialogue, there is no more reason to assume fictionalized imputation of antiplural-

Having acknowledged it, we can go on to press the one question that really matters in this inquiry: does this specific misrepresentation of Zeno which is explicit at (B), and of both Parmenides and Zeno which is implicit at (D), discredit the veracity of Plato's testimony at (C) above?⁴⁹ Does his [147] saying that all of Zeno's arguments were directed against plurality destroy the credibility of his allegation that Zeno is a devoted partisan of Parmenides?

The answer would certainly have to be "Yes," if the misrepresentation had been so formulated as to assert or imply (1) above, i.e., that the plurality thesis had been the formal refutand of all of Zeno's arguments. Had that been Plato's testimony, the consequences for the credibility of his whole account would have been shattering. For since we could hardly believe that Plato was unaware of the existence of Zenonian arguments, like the ones against motion, which make absolutely no mention of plurality nor any allusion to it, we would then have had to infer that his allegation at (B) was being made in open defiance of historical verisimilitude.⁵⁰ And in that case (we) would not know

ism to Zeno than of monism to Parmenides (the latter imputation is made also in other dialogues where fictional intent is totally excluded); moreover we know that the same monistic doctrine is ascribed to Zeno no less than to Parmenides by Aristotle (see (1) in n. 17 above) and Simplicius (*passim*). Once satisfied that Plato really errs in his interpretation of both Parmenides and Zeno at this point, we should bear in mind that even modern scholars—good ones, equipped with all the resources of philological research—have been guilty of misinterpreting Parmenides in ways which are at least as grave. Thus Burnet [1930, 178ff.] thought Parmenides a hard-line materialist, and Cornford [1939, 29] thought that the unity of Being was for Parmenides an undervived axiom from which all of its other attributes were deduced. I do not believe that Plato made either of these mistakes—certainly not the latter: in spite of the exaggerated importance of the unity of Being in his account of the Parmenidean system, Plato never suggests that this premise was the logically primitive assumption of the system. Plato has good insight into Parmenides' groundbreaking innovation, his semantic critique of the concept of Not-being. The language Plato uses in *Soph.* 237a when introducing Parmenides' ban on Not-being shows that he was well aware of the foundational (*archomenos te*) and pervasive (*καὶ διὰ τέλους . . . ἐκείστοτε λέγοντι*) consequences of this radical new departure for the whole of Parmenides' ontology.

⁴⁹ This seems to be the gravamen of Solmsen's critique of Plato's testimony about Zeno in the *Parmenides*, though he never puts it in this (or in any clearly equivalent) way, because (as I have pointed out above in n. 35 *sub fin.*) Solmsen does not take account of the import of the distinction between (B) and (C). Thus when he declares (119) that "the two summaries [of Parmenides' and Zeno's positions in 128b3–4, 'the one asserts unity, the other denies plurality'] interlock, and if one of them is discredited the other [is] too," what he has said so far is unimpeachable. But when he continues "and with it the thesis of an ultimate convergence between the two works are [*sic*] compromised," he *appears* to be assuming (without argument) that the value of Plato's testimony concerning (C) has been compromised by the discrediting of his testimony concerning (B). I have italicized "appears" because the import of the phrase "ultimate convergence" in Solmsen's statement is not entirely perspicuous and I am surmising that overall doctrinal agreement between the two works is what he means. (And cf. n. 51 below.)

⁵⁰ Something that never happens in any Platonic dialogue, to our knowledge. In all of the fictional scenes in which Plato brings on the stage historical figures like Protagoras, Gorgias, Thrasymachus, of whose views we have some independent knowledge from other sources, not once is there a case of such distortion. The Platonic portrayal of the personage in a given dialogue

what to believe in his testimony: why should he not also be thumbing his nose at verisimilitude at (C)?⁵¹ That is why I have labored so heavily the point that (B)—i.e., proposition (2), in contrast to (1), at the start of this section—is all Plato alleges in the text: this allegation, though certainly false, involves only Plato's own interpretation of the data, not their wilful distortion in a dramatic fiction. Once satisfied of this, we may proceed to satisfy ourselves that the mere fact that Plato is mistaken at (B) is not at all a sufficient reason for thinking that he must also be mistaken at (C). To conclude that if erring at (B) Plato must also be erring at (C), we would have to assume that he had no *other* grounds for believing in (C)—that he believed in (C) only because he thought that all of Zeno's arguments were directed against plurality. And, of course, that assumption would be so weak that it would be hardly worth defending. To see this, consider the elementary logic we would apply when a witness gives us two statements, P and Q, concerning which we know that while P is certainly false, Q is true *and would be known to be true by the witness himself even if the thought of P had never entered his head*. In such a case the fact that he asserts P along with Q, believing both of them to be true, would not damage, would not even touch, the veracity of that part of his testimony which only concerns Q. Such is surely the case with respect to (B) and (C) in Plato's testimony. For suppose that Plato had never taken so much as a look at Zeno's book and knew no more about its contents than even philistines would know, i.e., that it contained arguments purporting to prove that all motion is illusory. Would not that knowledge, all by itself, have led Plato to infer forthwith that Zeno had been Parmenides' philosophical partisan? Where else in the whole of the known spectrum of fifth-century philosophical views would there be room for one who rejected what everyone except Parmenides had accepted as a foundational, absolutely certain truth about the world? From just this consideration we can infer that the veracity of Zeno's belief in (C), which Zeno could, and would, have had even without (B), could not be impugned by the latter's falsehood. [148]

The assurance that Plato would have come to Zeno's book already convinced that its author was a disciple of Parmenides permits us to go one step further: we can even learn something positive from the testimony at (B) before consigning it to the junkheap to which it belongs. We can reason that when Plato did get into Zeno's book he was so impressed by the antipluralist, pro-Parmenidean import of the arguments he encountered there that he did not

may be highly selective (e.g., no mention or direct allusion to the *homo mensura* doctrine of Protagoras, nor to any of his epistemological doctrines, in the dialogue that bears his name), but there is never barefaced misrepresentation, such as would have been incurred had Plato alleged that plurality had been the explicit target of every argument in Zeno's book.

⁵¹ Which may be what Solmsen is suggesting, though I cannot be sure, the urbanity of his style of argument is not conducive to the crass assertion of so extreme a claim.

hesitate to credit Zeno with having written the whole book with that intention. To be sure, we do not know how far in Zeno's book Plato actually read. But since the arguments in which plurality was the explicit refutand came first, it would be reasonable to suppose that he had read several, perhaps all, of these, and that none of them had rebuffed his antecedent expectation that what he would find in the book would be true-blue Eleatic polemic.⁵² Thus what Plato says at (B), in spite of its falsehood, could even lend a measure of support to his testimony at (C); in any case, it certainly could not undermine it. To undercut (C) further evidence would be needed. Is there such evidence? The following items have been thought to be such:

(a) The argument against plurality reported by Simplicius in *Phys.* 139, 7–19 and 140, 34–141, 8 has been supposed⁵³ to have contained, in its first arm, an argument against unity

(b) Alexander *apud* Simplicius, *Phys.* 138, 3–28 and 141, 8–11 and Eudemus *apud* *ibid.*, 99, 7–16 have been thought⁵⁴ to be referring to Zenonian arguments against unity.

⁵² When Solmsen asks, "Had he [Plato] carefully and with something approaching philological accuracy worked his way through all *hypotheses* in the treatise and found out to his satisfaction what purpose they served?" we can, of course, agree that there is not the remotest chance of this. The last thing we could expect from him, or from any ancient philosopher, is to scan the books of earlier thinkers with the point of view of a scholar engaged in philological research. However, what is at issue here is whether Plato, after reading through a book which, as Solmsen holds (cf. n. 16 above), contained arguments against unity, no less than arguments against plurality would still want to maintain (before a public containing numerous readers of that book) that every argument in the book had been meant to be an argument against plurality.

On the same ground I would argue against the view of von Fritz that Zeno had meant to serve Parmenides not "dogmatically" but "aporetically," deploying arguments for both thesis and antithesis "in order to expose the difficulties in both assumptions" [1972, 58, cf. also *ibid.*, 75 and 78; and 1971, 42]. Now certainly dogmatic proof is totally alien to Zeno's method: his surviving arguments are visibly dialectical, proceeding always from premises supplied by the adversary. But neither may his mode of argument be correctly described as "aporetic" that term should be reserved for philosophical argument eventuating in *unresolved* perplexity, while Zeno employs argument whose logical form is that of *reductio ad absurdum*. If successful, they would eventuate not in perplexity but in the refutation of the hypothesis (with the qualification to be noted below, n. 64), and hence in the certainty that the premises from which the contradiction was deduced formed an inconsistent set; and this would involve Zeno himself in no perplexity whatever, since he does not subscribe to the premise-set, perplexity would result only for the adversary, and for him only so far as he might be left wondering what he could do, short of total capitulation, to revise his belief-system to make it invulnerable to attack. In any case, if Zeno were equally bent on exposing difficulties in the monistic thesis and in its pluralist antithesis, how could Plato, having read the book, portray its author, as Plato does at (D) above, as maintaining "virtually the same thing" as Parmenides does?

⁵³ Solmsen [1971, 129–37]; he argues that Zeno "knock[s] out 'the One'" on the way to knocking out "the many"

⁵⁴ Diès [1956, 16]. Solmsen [1971, 128–29]

(c) The allusion to Zeno in *Phdr.* 261c has been taken to imply that he was prepared to argue against, no less than for, Parmenidean theses.⁵⁵

(d) The allusion to Zeno in *I Alc* 119a has been taken as evidence that he was a professional sophist.⁵⁶

Items (a) and (b) I reserve for a separate discussion in the near future.⁵⁷ Item (d) I shall discuss in the Appendix to this chapter. Item (c) will be covered in the discussion of *Phdr.* 261c to which I proceed directly. [149]

II. QUESTIONS ABOUT *PHAEDRUS* 261c6–8

Do we not know that the Eleatic Parmenes by his art of speech made the same things appear to his hearers to be both like and unlike, both one and many, both resting and moving?

We are presented with three assertions:

P [All existents]⁵⁸ are alike and they are unlike

Q [All existents] are [i.e., constitute] one thing and they are many things.

R [All existents] are at rest and they are moving.

⁵⁵ See n. 16 above

⁵⁶ Diès [1956, 16]

⁵⁷ But I may at least point out two things here. In the case of (a): the crucial lines in Simplicius (139, 16–19), into which a Zenonian argument against unity has been read, contain nothing, to all appearance, which constitutes an argument against unity as such: all that Zeno had argued in this portion of the argument, according to Simplicius, is that if Being were One, it would have no size, and we know from Melissus (B9) how an Eleatic would use such an inference: he would take it as proving the denial of size, not of unity, to Being (see Vlastos [1971d], 119–20; and *ibid.*, 122, (**1 219–21, and 223–24) for the terms on which this is understandable in an argument against plurality [which was indubitably the formal refutand of the whole argument in which this particular inference was embedded. Zeno *apud* Simplicius, *Phys.* 139, 8–9 and 141, 6–8]). In the case of (b), neither Eudemus nor Alexander seems to be speaking from direct knowledge of the Zenonian texts; and we can track down one of the sources of their impression that Zeno "refuted the One" to their demonstrable misunderstanding of the context in which Aristotle introduces his paraphrase of a part of Zeno B2 in *Met.* 1001b7–8 $\xi\tau\iota\ \epsilon\lambda\ \alpha\delta\iota\alpha\lambda\epsilon\gamma\epsilon\tau\omicron\nu\ \alpha\upsilon\tau\omicron\ \tau\omicron\ \epsilon\nu\ \kappa\alpha\tau\alpha\ \mu\epsilon\nu\ \tau\omicron\ \lambda\eta\gamma\omega\nu\ \alpha\lambda\lambda\iota\omega\mu\epsilon\tau\alpha\ \omicron\upsilon\theta\epsilon\nu\ \alpha\nu\ \epsilon\lambda\eta$; they take this to mean that Aristotle is here reporting Zeno's assertion that "if the One were indivisible, it would be nothing" (see Eudemus *apud* Simplicius, *Phys.* 99, 10–12; Alexander, *Metaph.* 227, 11ff.), while a careful reading of the statement I have just cited from Aristotle in its own context (see the sequel, 1001b4–19, and the analysis in Vlastos [1971d, 134–35] (**1.237–39)) will show that it does not profess to report an inference drawn by Zeno, but only one which Aristotle takes it upon himself to draw on the strength of what he calls "Zeno's axiom." Nor is it at all clear that Eudemus and Alexander were referring to Zenonian arguments which they thought were directed against unity as such rather than against the unity of physical things (whose very existence an Eleatic would seek to disprove).

⁵⁸ There could be no doubt that by *ta auta* in *Phdr.* 261d7 Plato is referring to *ta auta* (cf. n. 8 above) and to all of them without exception (as is clearly the case in B1 and B3).

Each of these three conjunctions is supposed to be a genuine contradiction. We know that this supposition is false—clearly so in the case of *P* and *Q*, and possibly also of *R*.⁵⁹ But this is immaterial to our present business. All that matters here is that Zeno and his public *would* undoubtedly have reckoned each of the three a contradiction, and that Plato is not here concerned to challenge that assumption:⁶⁰ in this context he is willing to indulge it.⁶¹ This being the case, what precisely does he mean to tell us about Zeno? Is it that it was Zeno's intention to prove that each of the conjuncts in each of the three conjunctions, *P*, *Q*, *R*, is true? If so, the clash with (C) above would be blatant and the consequences would be devastating. A Zeno intent on proving both thesis and antithesis in *P*, in *Q*, and in *R* would be no ally of Parmenides. If this were really how Plato wants us to think of the historical Zeno, the picture of him in the *Parmenides* would have to be reckoned a travesty of the truth. But is that really what Plato means to tell us here? Before we can decide this, we have to ask ourselves if we should suppose that Plato (a) had, or (b) had not, made contact with⁶² Zeno's book by the time he wrote our text in the *Phaedrus*. [150]

Suppose (b). In that case, whatever Plato might mean to be telling us here could not unsettle the testimony he gives in the *Parmenides*, by which time he *had* got into the book.

Alternatively, suppose (a)—and this is surely the most likely possibility,⁶³ the only one worth serious consideration. In that case Plato would know, as he does in the *Parmenides*, the place which *P* had occupied in Zeno's discourse.

⁵⁹ There is no contradiction in saying in *P* that any two things are "alike" in one respect, unlike in another; or in saying in *Q* that anything is one *F* and many *G*s. And there would be no contradiction even in *R*, if motion and rest are treated as relative concepts (*x* moving relatively to *y* while at rest relatively to *z*) or qualified as to respect (*x* moving in one respect, resting in another).

⁶⁰ Though Plato is by no means entirely clear on the topic of relational properties, his Socrates argues in the *Parmenides* that in the case of *sensibles* the same things could be both like and unlike, both one and many: 128e ff. (cf. n. 34 above); in the *Republic* (436c–e) he points out that there is no difficulty in a thing's moving in one respect in relation to a given thing while (being) stationary in another respect in relation to other things.

⁶¹ He clearly implies it in characterizing Zeno's art as *antilogikē*, having illustrated *antilegousin* just before (261c ff.) by contradictory contentions of adversary litigants and of rival demagogues.

⁶² To dot the *is* and cross the *is*, we would have to add, "with good recollection of what he had read." I take this for granted so as not to complicate the argument unduly. Explicit allowance for it would not affect the drift of my argument.

⁶³ In the absence of any relevant information, it would be arbitrary to assume that a work whose paradoxes became so notorious in the fourth century (as we know from the fact that they are among Aristotle's favorite examples in his logical writings) got into Plato's reading just in the interval that separates the composition of the *Phaedrus* from that of the *Parmenides* (a few years, perhaps no more than two or three).

He would think of *P* as the apodosis of a conditional statement, whose protasis was the hypothesis,

H The things in existence are many.

this being the refutand of an argument which contrived the refutation by showing that *H* entails⁶⁴ the necessarily false conclusion, *P*.⁶⁵ Plato then would know that what Zeno was arguing for was not *P*, but (*P*, if *H*). He would thus know that Zeno was no more concerned to prove the (supposed) contradiction that all existents are both alike and unlike, than that he (Plato) was concerned to prove that there is no knowledge when he argued in the *Cratylus* (440a–c) that this enormity is entailed by the hypothesis that *everything is in total flux*. In saying this, I do not wish to slur over the fact that the language Plato uses in our text in the *Phaedrus* ignores completely the all-important distinction between

Zeno tried to prove *P*

and

Zeno tried to prove that *H* entails *P*.

If our present text in the *Phaedrus* had been the only reference to Zeno in the Platonic corpus, it would have been proper to infer that Plato thought of him as arguing for both arms of the (supposed) contradiction in *P*, for this interpretation of his text would be the simplest, the most economical, supposition of what Plato meant by ὥστε φαίνεσθαι τοῖς ἀκούουσι τὰ αὐτὰ ὅμοια καὶ ἀνόμοια. As things are, knowing, as we do from the *Parmenides*, the very argument of Zeno's which Plato must have had in view when he wrote those words in the *Phaedrus*, we are entitled to put on them a different accent: ὥστε

⁶⁴ In a modern context we would, of course, want to say it does so in conjunction with further premises whose truth is not in controversy. This qualification, generally ignored in the classical period, does not affect the argument, and I am, therefore, leaving it out of the text as a needless complication.

⁶⁵ This seems to be disregarded when Solmsen [1971, 140], glossing our text in the *Phdr.*, speaks of Zeno's "curiously contradictory hypothesis." Unless one is to argue (as Solmsen does not, and could not have argued with any plausibility) that in *Parm.* 127e1–2 (εἰ πολλὰ ἐστὶ, ὥς δεῖ αὐτὰ ὅμοια τε εἶναι καὶ ἀνόμοια) Plato had given an incorrect statement of the form in which τὰ αὐτὰ ὅμοια καὶ ἀνόμοια got into Zeno's argument, one should recognize that the latter phrase is not meant to refer to *two hypotheses*, but only to two conclusions *from the same hypothesis*—conclusions derived only for the purpose of refuting that hypothesis. We may note here that this is precisely the form in which the pairs of contradictory statements make their appearance in original fragments: that existents are "so small as to have no magnitude" and "so large as to be infinite" (B1) and, again, that they must be finitely many and infinitely many (B3). are not statements of *contradictory hypotheses*, but contradictory conclusions which refute the hypothesis that *polla est*.

φαίνεσθαι τοῖς ἀκούουσι τὰ αὐτὰ ὅμοια καὶ ἀνόμοια, that is to say, take them to mean that it was *to his hearers*—who thought Parmenides' doctrine preposterous, *not* to all, including the enlightened, who knew better—that Zeno made it “appear” that the same things are both like and unlike,⁶⁶ which he accomplished by proving to them that this (supposedly) horrendous [151] conclusion is entailed by their own innocent beliefs about the world which, of course, include *H*. This interpretation, which would have been too far-fetched to be worth arguing for if the *Phaedrus* text had stood alone, is a perfectly reasonable one on our present supposition that the man who penned that text knew that Zeno had not argued for *P*, but only for *P-if-H* in his book.

What then of *Q* and *R*, which Zeno had also made “appear to his hearers”? We have no report of a Zenonian argument which made a place for either of them. Should we suppose

- (i) that Zeno's book did contain one or more such arguments, or
- (ii) that it did not?

Let us consider each alternative:

First, (i). If Zeno had produced such arguments, the reasonable supposition would be that they followed the same pattern as that of the argument we have just examined.⁶⁷ In that case each of these contradictory conjunctions would have played the same role as did *P* in that argument, namely as the *absurdum* in a *reductio ad absurdum* argument. Hence once again there would be no clash with the *Parmenides*: as before, the contradictory “appearance” they enunciate would “appear” only to those who grant the hypothesis which is the refutand of Zeno's argument; Zeno would be arguing not that *Q* and *R* are true, but that they would be true if, *per impossibile*, the hypothesis were true.

Suppose, alternatively, (ii)—that Zeno's book contained no arguments in which the second and third pair of contradictory assertions had any place at all. This is certainly a possibility to be reckoned with. Thus, in the case of *R*, the Zenonian paradoxes known to us contain only arguments undertaking to prove that existents are not in motion. There is no place in any of them for the proposition that existents both are, and are not, in motion—hence none for “both at rest and in motion.” Even so, it is entirely possible that Plato, considering just the arguments which are known to us, would still have represented Zeno as “bringing it about by his art of speech that the same things appear to his hearers to be . . . both resting and moving.” For Zeno would not need to *produce* the appearance that “things are moving”: he could take that appearance for granted, given the stock of perceptions and beliefs his hearers had

⁶⁶ For the use of “making *p* appear” in a context where *p*, itself false, has been shown to follow from a refutand, cf. Democritus B155, φαίνεται τὸ τοῦ κυλίνδρου πεπονηθὸς ὁ κύβος.

⁶⁷ And that of the arguments in the original fragments B1 and B3—which is far more important—since in their case there can be no doubt that the conjunction of the pair of contradictory assertions is not itself the refutand but the conclusion which refutes the refutand.

been harboring since their infancy; to get these people into the frame of mind in which it appears to them that all things are “both resting and moving,” all he would have had to do would be to construct arguments to prove that all things are resting—the very arguments of which we know. Plato might well be thinking of readers carried along by Zeno's inexorable-seeming logic to a point where though the familiar world still looks the same to them, things in it seeming to move and change as much as they ever did, their mind, bewitched by Zeno's magic, protests that no race-course is ever traversed, no arrow ever flies. So too in the case of *Q*: here again the appearance of plurality would antecede and survive the arguments against it with which Zeno plied his hearers; so the contradictory “appearances” would be produced only by Zeno's arguments, deployed on minds powerless to rebut his proofs, yet also powerless to deny the message of plurality they still kept getting from their senses.

So far then as *Phdr.* 261d5–6 goes, there is no difficulty in squaring its Zeno with the one pictured in the *Parmenides*. Would this remain true if we were to take the context into account? I suspect that this, more than the three lines in 261d5–6, is what has created the impression recorded in Cornford's gloss on the passage:

But Plato seems to think of him as a mere sophist. At *Phaedrus* 261d, “the Eleatic Palamedes” who “can make the same things appear to his hearers to be both like and [152] unlike, one and many, at rest and in motion,” is classed as a controversialist (*antilogikos*) with the demagogue and the forensic orator, who can make the same action seem right or wrong as they please. All this is described as a rhetorical art of deception, ignorant of the truth and going in chase of mere belief. [1939, 67–68.]

Of the various things said here, one is quite correct: Zeno is indeed classed with the rhetoricians as an *antilogikos*.⁶⁸ But does that warrant the inference that Plato thinks him “a mere sophist” practicing “a rhetorical art of deception”? If so, his present picture of Zeno would belie not only the one he draws in the *Parmenides* but also his brief but telltale allusion to Zeno in another passage which I have not yet brought into the discussion: this occurs in the opening lines of the *Sophist*, where the Eleatic Stranger is introduced as τὸ μὲν γένος ἔξ Ἑλλάας, ἐταῖρον δὲ τῶν ἀμφὶ Παρμενίδην καὶ Ζήνωνα.

Here Plato couples Zeno's name with that of Parmenides for the purpose of identifying the philosophical group with which the Stranger has had friendly

⁶⁸ This is clearly implied by the connective (*ara*) in 261d10: from the reference to Zeno as “the Eleatic Palamedes,” it is inferred that the scope of *antilegein* covers not only the law court speechwriters and demagogues (who illustrate *antilegein* in 261c4–d5) but many others as well who do not engage in public oratory (περὶ πάντα τὰ λεγόμενα here; cf. ἀλλὰ καὶ ἐν ἰδίῳς ἀφ' οὗ μόνον ἐν δικαστηρίῳ καὶ ὅσοι ἄλλοι δημόσιοι σύλλογοι in 261a8–9). This shows that Zeno is meant to fall inside the range of those engaging in *antilegein*, but outside that of those two classes of rhetoricians.

association.⁶⁹ This fits perfectly Plato's representation of Zeno at (C) above, and not at all the picture of "a mere sophist" practicing "an art of deception": no one answering to this description could have stood in Plato's mind side by side with Parmenides, that "reverend and awesome" figure,⁷⁰ at the center of the Eleatic circle. Since this reference to Zeno in the *Sophist* is not connected dramatically with the *Parmenides* in any way whatever—there is no allusion here to a meeting of the two in Athens or to anything else which would suggest that Plato is harking back to the imaginary *mise-en-scène* of that dialogue—it cannot be explained away as dramatic fiction; it must be taken as a true indication of the way Plato really thought of Zeno's place in the Eleatic movement and his relation to its founder.⁷¹ And since the composition of the *Sophist* certainly postdates that of the *Parmenides*, hence postdates the time by which Plato is known to have had access to Zeno's book, we are compelled to believe that this close bond between Parmenides and Zeno gibboned with what one would learn of Zeno's philosophical orientation from a reading of his work.

Can this be reconciled with the fact that in the *Phaedrus* Plato classes Zeno as an *antilogikos*? Could Plato have thought of someone as addicted to *antilogikē* without thinking him a deceiving sophist? If we were convinced that the answer to this question is "No," we would simply have to conclude that for reasons unknown Plato wrote the *Phaedrus* with a radically different mental picture of Zeno from the one he presents in the *Parmenides* and [153] sustains in the *Sophist*. Fortunately we do not need to resort to so extreme a hypothesis. We have the means of satisfying ourselves that while *antilogikē* has always unfavorable connotations in Plato, these are by no means so discreditable as to imply that by labeling someone *antilogikos* Plato is consigning him to the outer darkness of "mere sophistry" and deception⁷²—that for Plato

⁶⁹ I would not press as far the implications of *ἐταίρος* τῶν περὶ Παρμενίδην καὶ Ζήνωνα as does Lewis Campbell [1867] (followed by Cornford) in translating "adherent of the school of Parmenides and Zeno." There is no evidence that *hetairōs* in Plato ever quite carries the sense of "philosophical partisan or adherent" which is so common in the doxographic literature; Campbell's only reference (to *Theaet.* 180c) is no such evidence, for it indicates philosophical congeniality, not doctrinal partisanship—the latter is not in question in that context. Anyhow, the Eleatic Stranger is depicted as a singularly free spirit, whose association with the Eleatic circle does not prevent him from criticizing some of its most fundamental doctrines, as he proceeds to do in the dialogue.

⁷⁰ *Theaet.* 183e. Parmenides is the one predecessor (with the possible exception of Socrates) for whom Plato has a filial feeling: cf. the reference to "father Parmenides" in *Soph.* 241d.

⁷¹ Zeno is similarly associated with Parmenides at, or near, the center of the Eleatic movement by Aristotle in *Soph. el.* 182b26, as I have pointed out above, n. 17, where I proceed to point out that Zeno is similarly associated with Parmenides in the doxographic tradition; to the references given there, I may add Cicero, *Acad. prior.* 2, 14, 129, referring to the Eleatic antecedents of the Megaricans, he names Xenophanes who, he says, was followed by "Parmenides and Zeno, after whom the Eleatic philosophy was named."

⁷² For Plato the two are inseparable: the sophist's art is a species of deception (τὴν τέχνην εἶναι τινα ἀπατητικὴν αὐτοῦ, *Soph.* 240d, cf. *Soph.* 246d).

antilegein may be an honest, though small-minded and unproductive, species of philosophical debate.⁷³ We are assured of this by specimens of dialectical procedure within the dialogues which the Platonic Socrates calls *antilogikē*. Thus in *Theaet.* 164c Socrates deprecates his refutation of Protagoras,⁷⁴ saying that we seem to have won the argument *antilogikōs*, which is unworthy of us, since we profess to be philosophers, not contestants. If we go over that argument and its sequel, we can see that never does it lapse into sophistry; in none of his inferences does Socrates resort to verbal trickery, at no point does he try to palm off a fallacious argument on his interlocutor.⁷⁵ His fault is that of a contentious—not a dishonest—prosecutor: he wins his case by taking advantage of "verbal admissions" (πρὸς τὰς τῶν ὀνομάτων ὁμολογίας)—admissions the adversary makes "when giving no more thought to the words he is using (μὴ προσέχων τοῖς ῥήμασι τὸν νοῦν) than we commonly do when making admissions and denials."⁷⁶ Later on in the same dialogue (197a), Socrates says he would not allow himself now the use of "knowing," "knowledge," and their contraries if he were *antilogikos*, since at this stage of the inquiry the meaning of these terms is still in controversy; the *antilogikos* would protest any use of these terms in the argument before an agreed-upon sense had been reached; it would not be "clean dialectic" (*katharōs diallegesthai* 196c) to do so, the *antilogikos* would say. Here this character is the very opposite of the sloppy or unscrupulous arguer; he is one who insists (too much) on the observance of strict rules of disputation; he is the sticky debater who confuses procedural rigidity with intellectual rigor. With all the fuss he makes about formalities, he misses the weightier procedural points: thus he fails to realize that once the adversary has been allowed to argue *ex hypothesēōs* only inferences drawn from the hypothesis, not the hypothesis itself, should be contested;⁷⁷ and he lacks the capacity to "investigate the topic under discussion by dividing things into kinds,"⁷⁸ which is for Plato the *sine qua non* of productive inquiry in philosophy.⁷⁹

⁷³ With the broader use of *antilegein* to mean simply "contradicting," we are not concerned in the present discussion.

⁷⁴ 163a–164b, continued in the same vein in 165b–e.

⁷⁵ Grave as are the defects of the tactics used by Socrates against Protagoras in *Theaet.* 163a–164b and 165b–e, they would differ as day from night, in Plato's view, when compared to those used against Socrates by the protagonists of the *Euthydemus*, whose art, denominated *eristikē* (272b10), not *antilogikē*, is said to display itself in the ability "to engage in verbal combat and to refute any given statement, be it false or true" (272a–b).

⁷⁶ I.e., admissions that would not have been made if the adversary were exploiting more intelligently and resourcefully the options left open to him by his own position—as Protagoras is represented as doing in that marvellously ingenious argumentative palinode that Plato makes up for him in 166a ff.

⁷⁷ *Phaedo.* 101d–e and *Rep.* 437a.

⁷⁸ *Rep.* 454a; cf. *Phaedr.* 265c.

⁷⁹ It is the method of Division and Collection that distinguishes for Plato true dialectic from every other mode of inquiry (*Phaedr.* 266b–c). His confidence in this method is so vast that it prompts him to claim for it in the *Philebus* (16c) every (philosophical) discovery ever made!

Clearly then Plato has a low opinion of *antilogikê* as a style of philosophical debate. But not one of the charges he brings against it would suggest that he thinks of it as "mere sophistry" and "an art of deception." Hence no such imputation to Zeno can be inferred just from the fact that he is classed with the *antilogikoi*. To justify the imputation, further evidence would be needed. Where would we find this? Certainly not in the phrase "Eleatic Palamedes." For the Greeks of the classical era, Palamedes personifies inventive genius, not crookedness.⁸⁰ Though he displays craft and cunning in some of the tales, [154] resourceful contrivance, not double-dealing, is his characteristic trait.⁸¹ When Dionysus says to Euripides in the *Frogs* (1451)

εὖ γ, ὦ παλάμηδες, ὦ σοφωτάτη φύσις

he is expressing admiration for the shrewdness of what Euripides had suggested,⁸² and for that alone: there was no trickery in the suggestion, and none is imputed. And that Plato himself is not making an eccentric use of the figure of Palamedes to suggest that Zeno is a deceiving sophist may be gathered from the immediately preceding lines: Socrates had introduced the figure of Palamedes (261b) as an orator of a different stripe from both Nestor and Odysseus; and Phaedrus had chimed in to say, without objection from Socrates, that Nestor stands for Gorgias and Odysseus for Thrasymachus and Theodorus. Thus Plato is dissociating Zeno from both the verbal pyrotechnics of a Gorgias and from the unscrupulous tactics of sophists like Thrasymachus. And the latter contrast is the sharper one, since Thrasymachus' heroic stand-in, Odysseus, is the legendary rival and destroyer of Palamedes. So if there were imputation of deceit to anyone, it would be directed not at Zeno—no more at him than at Gorgias—but at the likes of Thrasymachus, for it is their patron hero, Odysseus, who, as we know, typifies for Plato deceit and guile.⁸³

I conclude that there is nothing in this whole passage in the *Phaedrus* to lend color to the notion that Zeno is portrayed here as a "mere sophist," instead of the serious and honest, if narrowly disputatious, dialectician he

⁸⁰ In the Aeschylean tragedy which bears his name, he claims the discovery of number and of so many other useful inventions as to have rescued "Greece and its allies" from a brutish to a civilized state (frg. 182A). In Gorgias' *Defense of Palamedes* (B11a(30)), he claims to have done as much not only for Greece but "for all men," itemizing such inventions as written laws, writing, weights and measures, number. See Kleingünther [1934, 78–84] and, for a detailed account of his place in the legend, H. Levy, Roscher's *Mytholog. Lex.* III 1271ff.

⁸¹ In Aristoph., *Thesm.* 769, πόρον ἐκ τοῦ Παλαμήδους, the word *poros* is misleadingly rendered "trick," as is also *ergōi porimōi* a few lines later, by B. B. Rogers in his translation. The reference is to a clever contrivance.

⁸² To put its trust in the "good" (conservative) people and distrust the demagogues (verses 1445–50).

⁸³ The theme is developed at length in the *Hip. Mi.*, where the Homeric Odysseus is represented as not only *polutropos* and *polumêchanos* but as a thoroughgoing liar, a man full of deceit and guile (*pseudês*, 365, δολερὸν τε καὶ πολλὰ ψευδόμενον, 369c).

would have had to be to fit the role Plato assigns him in the *Parmenides*. To be sure, neither do we get any information in the *Phaedrus* which would of itself have given us reason to cast Zeno in the latter role. But this passage is not needed for that purpose: for that the *Parmenides* is amply sufficient, and it is further assured by the association of Zeno with Parmenides in the *Sophist*. All we need here is to satisfy ourselves that what is said in the *Phaedrus* does not undermine what is said in the *Parmenides*. And that, I trust, has now been done.

APPENDIX: ALCIBIADES I, 119A1–6

But can you mention some other person—Athenian or stranger, slave or freeman—who was made wiser because of his association with Pericles, as I [Socrates] can cite Pythodorus, son of Isolochus, and Callias, son of Calliades, each of whom became wise and highly reputed, having paid one hundred minae to Zeno?

Zeno is represented here as teaching for pay: this is clearly the force of *teleō* in *hekaton mnas telesas as*, e.g., in *Ap.* 20a, ὅς τετέλεκε χρήματα σοφισταῖς.⁸⁴ To so represent him is to portray him unmistakably as a professional sophist: a man mentioned in an ostensibly Platonic work as making others "wiser" for pay could not have been thought of as anything but this; I know of no counter-example to this generalization, which is based on a plethora of testimonia.⁸⁵ Now if this is what Zeno had been in fact, how could we account for the [155] portrait in the *Parmenides*? Do we not know Plato's veneration for Parmenides, his scorn for sophists as hucksters of pseudo-wisdom and pseudo-virtue? Even if we were to think of that portrayal as pure invention, this would not mitigate the difficulty: even in a fictional setting, why should Plato have cast a *sophist* in the role he gives Zeno there—that of Parmenides' faithful disciple and intimate friend, erstwhile boy-love,⁸⁶ now traveling-companion and fellow-guest in the home of an upper-class Athenian?⁸⁷ On just these grounds, I submit, the historical veracity of this text in the *Alcibiades* would be highly suspect. So it is strange that its credibility should have been conceded unquestioningly by the overwhelming majority of the

⁸⁴ And cf. the numerous references collected in Ast, *Lex. Plat.*, s.v. *telō* last seven lines of p. 374 and first four of p. 375, for payment of fee to sophists.

⁸⁵ Cf. Harrison [1964, 191 and nn.]: "nothing emerges more clearly from the dialogues than the fact that, for Plato, this feature of sophistry was crucial." He gives over thirty references to Platonic passages which bear out the generalization.

⁸⁶ An erotic relation would be for Plato a coarse, even a shameful thing, if it did not involve deep intellectual and spiritual rapport. Could Plato have thought of the "great" Parmenides having that kind of relation to a young sophist?

⁸⁷ In Plato the sophist's profession bears a social, no less than an intellectual, stigma: see *Prot.* 312a. Would Parmenides want to advertise the liaison by bringing along the young demi-mondain to Athens as Pythodorus' house-guest?

scholars who have referred to it.⁸⁸ It is high time the bill of particulars was drawn up against it.⁸⁹

The preponderance of learned opinion has inclined against the authenticity of *I Alcibiades*,⁹⁰ and I shall proceed on a long-standing conviction, for which I cannot undertake to argue here, that the dialogue as a whole is spurious.⁹¹ But this, of course, would be much too general a ground on which the case against this particular text could be made to rest. For though a forgery, its composition need not have been late. It could have been written within two generations of Plato's death.⁹² So the author might have had access to reliable information had he sought it—had he been interested in getting facts instead of indulging his own invention. There is no indication that any historical inquiry lies back of this allusion to Zeno as the supposed instructor in "wisdom" of two prominent Athenians. The question the author puts into Socrates' mouth is simply meant to drive home the Platonic doctrine that if one knows, one can teach,⁹³ which is invoked here in the more special form it assumes in the *Gorgias*: There Socrates had argued that proof of one's possession of a given skill (e.g., the physician's) must come in one's actual use of it to improve persons with whom one deals. He had explained that if he, Socrates, had professed to be a public physician, it would be proper to ask him,

Is there anyone . . . slave or freeman, who has ever been rid of disease because of Socrates? (514d7–8) [156]

So, too, Socrates had continued, it would be proper to test Callicles' political pretensions by asking,

⁸⁸ Including all of the following: Bocckh [1842, 121]; Diès [1923, 16]; Burnet [1924, 87, on *Ap.* 20b9]; Lee [1936, 5]; Neslé [1942, 259]; Guthrie [1965, 80–81]

⁸⁹ It is astonishing to see Zeller, normally so thorough, rejecting the testimony of our text with the offhand remark that "the first *Alcibiades* is too poor a source" [1923, 743 n.].

⁹⁰ For a good *précis* of the case against authenticity in the older literature, see Heide [1896, 61ff.], references to the later literature in Cherniss [1960, 71–72], the most valuable is the critique by E. de Strycker [1945, 101ff.] of defenses of the authenticity of the dialogue.

⁹¹ One of the later contributions to the literature, Clark's [1955, 231ff.] argues that "the first two-thirds of the dialogue are the work of a pupil or follower of Plato, while the last part is by Plato himself, written in his middle period or at some time after the *Republic*." I find it hard to believe that Plato, in years of great productivity, would take the time to put this kind of patch on a pupil's work—work which, along with a plethora of echoes and regurgitations of what he had said better in his own works, propounds notions which he would surely have found unacceptable (such, certainly, is the extraordinary, and extraordinarily favorable, picture of the education of the heir-apparent to the Persian throne [121c–122a] cf. the deplorable education of Cyrus and his sons at the hands of women and eunuchs in *Laws* 694c–695b—the contrast is surprisingly overlooked by champions of the authenticity of *I Alc.*, as in Friedländer [1964, 236 and 350–51]). However, even on Clark's view the Platonic provenance of our present text would be denied, since it falls in his rejected "first two-thirds" of the dialogue.

⁹² "We run no risk in dating it not later than the beginning of the third century B.C.," Heide [1896, 71]. Others would place it earlier.

⁹³ For copious references to this doctrine in the Platonic corpus, see Shorey [1933, 652].

Say now, has Callicles ever improved any citizen? Is there anyone—alien or citizen, slave or freeman—formerly a bad man, unjust, intemperate, unwise, who was made noble and good because of Callicles? (515a4–8)

And as Plato there had used Pericles (515c ff.) as an example of a man whose reputed wisdom fails the crucial test, so does our author here: his Socrates raises the same question about Pericles which the Platonic Socrates had put to Callicles, recycling some of the phraseology Plato had used there—alien/citizen,⁹⁴ slave/freeman.⁹⁵ Our author improves on the *Gorgias* by setting up Zeno as an example of a wise man who passes the test Pericles fails⁹⁶ and picks the fortunate beneficiaries of Zeno's wisdom from the Platonic corpus: Pythodorus from *Parm.* 126b ff.,⁹⁷ Callias from many references in the dialogues to his lavish patronage of sophists.⁹⁸ And he has them paying fees whose magnificence, he thinks, would fit the opulence of the clientele, lending color to Socrates' remark in the *Apology* (20a) that Callias had "spent more money on sophists than everyone else put together" (translation by F. J. Church). So our text in the *I Alcibiades* makes as much use of Platonic materials as could be expected in a moderately skilful pastiche.⁹⁹ But I realize that

⁹⁴ Substituting *Athēnaios*, in lieu of *astox*, with good Platonic precedent (cf. 'Αθηναῖοι καὶ οἱ ξένοι, *Gorg.* 472a), though Plato's usual way of making the contrast is by pairing *xenos* with *astox* (*Ap.* 30a, *Rep.* 613d, *Theaet.* 145b, *Gorg.* 473d and 513a).

⁹⁵ Here, I think, the forger is caught out, for he has missed something Plato would not have missed: the suggestion that no less a personage than Pericles could be expected to prove his wisdom by passing it on to slaves as well as freemen would have struck Plato's public as a curiosity, if not an absurdity. A better writer would have counted on some way of cushioning the shock of the suggestion by preparing the reader for it. This Plato had done in the *Gorg.* by introducing a few lines earlier the slave-freeman phrase in the context of the public physician, where the notion that slaves too are a proper part of his constituency would have been entirely acceptable (cf. Dodds [1959] ad 514d8). By bringing in the politician in this passage on the physician's coattails, Plato establishes a *prima facie* plausibility for what would otherwise have seemed an outrage—the expectation that to make good as a politician Callicles must make even slaves *kaloi k'agathoi*! Nothing comparable in our text in the *Alc.*, whose author, I suggest, missed the link between 514d and 515a in the *Gorg.* when wrenching the "slave or freeman" phrase from the latter passage.

⁹⁶ The incongruity of Plato's picking, without apparent irony, a sophist to serve as a true instance of wisdom does not seem to strike our author. Compare the urbane, but unmistakable reservations in the reference to Euenos as a *sophos* (especially the trailer in 20b9–c3) and to Callias in *Crat.* 391b, who πολλὰ τελέσας χρήματα σοφὸς δοκεῖ εἶναι.

⁹⁷ He probably took the phrase ἄλλὰ καὶ πρότερον ἀκηκοέναι [sc. Pythodorus] τοῦ Ζήνωνος in 127d4–5 to mean that Pythodorus had been Zeno's pupil. This is, of course, an acceptable use of *akouein tou deina*. But it is almost certainly not the sense here: the cited clause follows *ἐπακουσαι τῶν γραμμάτων* in the preceding colon (127d3–4), which had been preceded a few lines earlier by ἀκοῦσαι τῶν τοῦ Ζήνωνος γραμμάτων (127c3); so the continuity of the thought would require us to understand after ἀκηκοέναι τοῦ Ζήνωνος something like ἀναγινώσκοντες, unless some new material had been interpolated to dictate a change of sense.

⁹⁸ See under "Callias" in the Abbott Knight Index in Hamilton and Cairns [1961, 1625].

⁹⁹ Which is true of the dialogue as a whole. Cf. Shorey's remark that Plato "repeats or quotes

this line of objection will hardly move scholars committed to the dialogue's authenticity. Can the case against the reliability of this particular testimonium be made to rest on more specific grounds? It can:

First and foremost among these, I would place the clash of this Zeno-sophist of our text with the figure portrayed elsewhere by Plato as Parmenides' right-hand man. I have already alluded to this point and will not labor it further. But I may add the following: the Zeno-sophist of our text would be equally hard to reconcile with the philosopher [157] Plato pairs in the *Sophist* with Parmenides as the central figures of the Eleatic circle,¹⁰⁰ and with the like position Zeno occupies in Aristotle and in the doxographic tradition,¹⁰¹ as also in Simplicius.¹⁰² No such difficulty would arise over the Zeno depicted as *antilogikos* in Plato's *Phaedrus*, as the inventor of dialectic in Aristotle,¹⁰³ as an eristic in some later writers:¹⁰⁴ all of these designations are understandable as different shadings of the very thing we are told about him in the *Parmenides*: that he is only a controversialist, had no constructive doctrine of his own, invests all of his intellectual capital in purely destructive arguments, directed against anti-Parmenidean theses which are the backbone of the commonsense view of the world.¹⁰⁵ And to say this, obviously, does not begin to say that he was a sophist.

Second, we must reckon with the fact that the story about Zeno in our text seems to have gained no credence in antiquity, and this in spite of the fact that the Platonic authorship of *I Alcibiades* was widely accepted.¹⁰⁶ For if it had

himself more" in this dialogue than in any of his genuine works [1933, 415], and Heidegger's words. "In its character as a primer of Platonism in regard to ethics and politics *I Alc.* contains a greater number of distinctive Platonic thoughts than can be found in any of even the greater single works of Plato. In this respect the dialogue may be pronounced too Platonic." [1896, 62.]

¹⁰⁰ *Soph.* 216a, discussed in Section (II) above

¹⁰¹ Cf. nn. 17 and 71 above.

¹⁰² Cf. n. 17 above

¹⁰³ *Fig.* 1 (Ross) [*apud* *Diog. Laert.* 8, 57]: "Aristotle says in the *Sophist* that Empedocles was the discoverer of rhetoric, Zeno of dialectic

¹⁰⁴ Galen (*Hist. philos.* 3; *Dox. Graeci* 601, 8–9) cites him as Z. ὁ Ἐλεάτης ὁ τῆς ἐριστικῆς φιλοσοφίας ἀρχηγός. Epiphanius (*Advers. haer.* 11; *Dox. Graeci* 590, 20) speaks of him as Z. ὁ Ἐλεάτης ὁ ἐριστικός to distinguish him from "the other Zeno."

¹⁰⁵ This fits perfectly Aristotle's view of the dialectician as arguing not from philosophically demonstrable premises, but from generally received opinions (*ex endoxōn*) and, in particular, from beliefs already held by his interlocutor (τὰς τῶν πολλῶν κατηγορημένους δόξας οὐκ ἐκ τῶν ἀλλοτρίων ἀλλ' ἐκ τῶν οἰκείων δογμάτων ὁμιλήσομεν πρὸς αὐτούς, *Top.* 101a31–32). Sophistry is, of course, firmly distinguished from dialectic in Aristotle (see, e.g., *Top.* 171b4ff. and *Rhet.* 1355a25–b25), but not from eristics, which Aristotle tends to conflate with sophistry. And if Galen had applied eristics to Zeno in that sense, that would certainly show that he was thinking of Zeno as a sophist. But Galen has a drastically different sense in view: his eristics are notably the Megarian and Eretrian dialecticians (ἐριστικούς δὲ κεκλήκασι Εὐκλείδην καὶ Μενέδημον . . . [*Hist. philos.* 7; H. Diels, *Dox. Graeci*, 604, 15–16]).

¹⁰⁶ Two examples: Diogenes Laertius so speaks of it (*Vitae Philos.* 3, 51) citing it as a speci-

been believed, Zeno would have been a star-example of the fee-charging sophist for the ancient historians, and his name would have vied with those of Protagoras and Gorgias in allusions to the great lights of the sophistic movement, while the fact is that there is not a single mention of Zeno as a professional sophist in any of our sources.¹⁰⁷ Not only does the story in our text pass without corroboration;¹⁰⁸ it seems to be denied by implication in Diogenes [158] Laertius,¹⁰⁹ who observes that

Zeno preferred his own native city . . . to the magnificence of Athens, having never sojourned there (οὐκ ἐπιδημήσας πώμαλα πρὸς αὐτούς), but having lived at home throughout his life (ἀλλ' αὐτόθι καταβιούς). (*Vit. Philos.* 9, 28.)

Since *epidēmein* would certainly cover a residence in Athens long enough to

men "maieutic" dialogue, Plutarch says *Platōn historēke* when citing the dialogue as a source (*Vita Alc.* 1; and cf. his probable, though unacknowledged indebtedness to *I Alc.*, 106e, in *ibid.*, 2 [p. 259 in the Teubner edition of *Vitae parallelae*, vol. I, fasc. II, by Cl. Lindskog and K. Ziegler])

"Nor, to my knowledge, any reference to him as *sophistēs* at all. When Taylor [1934, 38] says that "writers who wish to distinguish Zeno of Elea from Zeno of Citium and other persons of the same not unusual name call him *ho sophistēs*," he gives no reference; I think he is bluffing. The usual, and perfectly sufficient, mode of reference for this purpose is simply *ho Eleatēs* (so, e.g., ps.-Plutarch, *Strom.* 6 [cited in n. 17 above]; so too in Galen, *Hist. Philos.* 7; *Dox. Graeci*, 604, 14), but often with additions, τὸν Ἐλεάτην τοῦ Παρμενίδου γινώσκον, Alexander, *Met.* 227, 13–14 (and cf. n. 104 above). But, of course, if Zeno were called *ho sophistēs* somewhere or other in the literature, this would of itself prove nothing for the point at issue, namely that, as Taylor contends, Zeno was thought of as a professional teaching for pay: Pythagoras is so called by Herodotus (4, 95); Anaxagoras by Diodorus Siculus (12, 39) and Athenaeus (5, 220b); Hecataeus of Abdera by Plutarch (*Vita Lys.* 20)

¹⁰⁷ The closest we get to this anywhere in our sources in Plutarch (*Vita Per.* 4, 3)

And Pericles heard also Zeno the Eleatic discoursing about nature like Parmenides (πραγματευομένου περὶ φύσιν, ὡς Παρμενίδης), but practicing a certain kind of refutation and, by means of contradictions, trapping one in perplexity (ἐλεγκτικὴν δὲ τινα καὶ δι' ἀντιλογίας καταλείουσαν εἰς ἀπορίαν).

But note that there is no suggestion of Zeno's teaching Pericles for pay, and that by using the phrase *pragmatemenou peri phusin* to describe the theme of Zeno's discourses Plutarch connects him with the natural philosophers rather than with the sophists, while recognizing that, unlike the discourses of the *physiologoi*, Zeno's were predominantly elenctic and aporetic. (The simplest explanation of this peculiar tale is that it is an embroidery on our text in *I Alc.*—if Pythodorus and Callias are to be beneficiaries of Zeno's teaching, why not also Pericles, that connoisseur of fine intellectual imports—made by somebody or other who is familiar with the general content and temper of Zenonian dialectics. Plutarch's source included edifying tidbits, like Zeno's retort to Pericles' detractors about *doxokopein* in 5, 4).

¹⁰⁸ As would be also the one in Plutarch cited in the preceding note, if Diogenes knew it (as he well might, he cites twice a Plutarchean *Vita* [Lysander's] as a source [4, 4; 9, 60]) and took it to mean that Zeno's contact with Pericles involved a stay at Athens long enough to count as *epidēmein* (as Diogenes might, both the context and the use of the verb *diēkouse* suggest more than a brief encounter during a few days' visit).

give Pythodorus and Callias their money's worth of sophistic instruction,¹¹⁰ Diogenes' statement implicitly denies that there was any such period in Zeno's life. Though he cites no source and does not indicate his reasons, it is significant that he should have gone out of his way to issue that denial in the face of our text in *I Alcibiades*¹¹¹ which he would have thought backed by Plato's own authority;¹¹² it shows, at the very least, that his own sources, so much more abundant than those in our possession, offered him no creditable corroboration of the story in our text.¹¹³

Finally, we can spot within our text a very peculiar item which, I shall argue, is a recognizable fiction: the hundred mina fee.¹¹⁴ The going rates for sophistic instruction around this time we can judge from contemporary evidence of unimpeachable authority. In the *Apology* (20b) Socrates mentions what Callias expects to pay Evenus of Paros for the instruction of his sons: five minas. Socrates says this in an address to several hundred Athenians, many of whom would be in a good position to know what sophists were charging.¹¹⁵ Isocrates speaks of the sophists teaching for "three or four minas."¹¹⁶ That he himself [159] charged ten for the *de luxe* course of instruc-

¹¹⁰ A sophist's residence in a city for the period he would need to give a course of instruction would come well within the scope of *epidēmein* see, e.g., the numerous uses of the term for just this purpose in Plato, listed in Ast s.v. *epidēmo*, *epidēmia*. Guthrie seems to ignore this well-documented usage when he assumes [1965, 80–81] that Diogenes' denial would not exclude visits in Athens such as would be required by our text in *I Alc*.

¹¹¹ Cf. n. 106 above.

¹¹² Though Diogenes' historical judgment is wobbly, his greatest fault is uncritical receptivity to what he finds in his sources. Without strong reason to the contrary, he would be vastly more likely to accept than to reject a testimonium whose authority he thought Plato's own.

¹¹³ And that he did not so count the tale in Plutarch.

¹¹⁴ I must argue against this figure in detail, for it has gone virtually unchallenged in the scholarly literature. The only eyebrow it has raised, to my knowledge, is Zeller's, and that only in another context (when confronting its ascription to Protagoras [1920, 1299n 3], he remarks, "Jene Summe ist ohne Zweifel sehr übertrieben").

¹¹⁵ That five minas is no lower than the prevailing rate and is quite likely higher we may infer from the fact that Socrates is speaking of a case where the prospective client is Callias and is alluding to the great sums this rich man—the richest in Athens—has spent on sophists (cf. the quotation from *Ap.* 20a in the text above).

¹¹⁶ *Adv. soph.* 3–4. It is a mistake to speak of this as an "absurd" (i.e., absurdly low) figure ("Spottpreis," Zeller [1920, 1344n. 3]), thus four minas, though little enough for what the seller claimed he would deliver for it (σύντασιν . . . τὴν ἀρετὴν καὶ τὴν εὐδαιμονίαν), would be no paltry sum in itself: it would be considerably larger, for example, than what a good mason would earn in the course of a whole year. [In the accounts of the construction of the Erechtheum on the Acropolis in 409–406 B.C., "the daily wage of the artisan, whether citizen, metic or slave, was one drachma, irrespective of the work in which he was engaged. . . . Even the architect received only one drachma and his assistant secretary only five obols a day, but these were regular stipends paid each prytany and not dependent upon the number of working days" (Tod in *Cambridge Ancient History*, V [1953, 24–25]). If Evenus had collected five minas from each of, say, ten students in the course of a year [for this figure see n. 122 below], he would have enjoyed an income more than thirteen times greater than the combined income of the architect, his secretary, and eight skilled masons.]

tion in his school we know from Demosthenes.¹¹⁷ But when we come to later authors, the fee supposedly charged by the great sophists shoots up to 100 minas. Diodorus Siculus (first century B.C.) has Gorgias charging this figure;¹¹⁸ Diogenes Laertius ascribes it to Protagoras.¹¹⁹ Where these authors have fished up this startling figure (100 minas = 10,000 drachmas = 1-2/3 talents) they do not say: neither gives any indication of a source. That it is false we can judge from two considerations. First, it is wildly out of line with the earlier figures which have just been cited, all falling within the range of from 3 to 10 minas, the highest of them being the one charged by Isocrates, as famous and fashionable a teacher of rhetoric in his time as Gorgias had been in his, and for a course of study which Isocrates says¹²⁰ lasted from three to four years, while we have no indication that the term of instruction given by Gorgias or Protagoras was nearly as long.¹²¹ Second, we have the account of Hippias' instructional tour in Sicily in Plato's *Hippias Major*. Socrates had just remarked that Gorgias and Prodicus had each "earned more from his wisdom than had any craftsman (*dēmiourgos*) from any craft whatever"¹²² and that "so had Protagoras before them" (282e). Hippias replies:

¹¹⁷ *C. Lacrit.* (*Or.* 34) 42. Same figure in the pseudo-Plutarchian *Vitae X Or.* ([Plut.] *Mor.* 837C: *Vita Isoc.*, 43).

¹¹⁸ 12, 53.

¹¹⁹ 9, 52. Other references in Boeckh [1842, 121n 576].

¹²⁰ *An.* 87.

One gets the opposite impression from the absence of any allusion to residence by Protagoras or Gorgias at Athens for any period even remotely approaching such a length.

The highest pay I have encountered for a person whom Plato would reckon a *dēmiourgos* is in Herodotus (3, 131) for Democedes, the most famous physician of his age. Aegina hires him from Croton at one talent per annum, a year later Athens from Aegina at 100 minas, the year after Polycrates brings him to Samos from Athens at 2 talents. Even if we assume that Socrates would have in view this last figure (escalated under exceptionally heavy intercity bidding) and would think of it as earnings by a craftsman rather than as the indulgence of a tyrant's whim, his comparison would still be sustained by allowing the sophists Socrates has in view to be charging no more than the highest of the above-mentioned rates for the fifth and fourth centuries. The sophists would have needed to take in no more than thirteen students at 10,000 drachmas a head to exceed comfortably the two talents it had cost Polycrates to wrench Democedes away from Athens. (The only apparently reliable figure I have for the number of students enrolled by a teacher of rhetoric is the one for Isocrates at Chios in [Plut.] *Mor.* 837B: he had nine students there when only just starting his teaching career; he must have had many more later on as his fame soared, and it would be safe to make the same assumption for Protagoras & co. in the fifth century (the figure of 100 given for the students in Isocrates' school in Athens by the same source [ibid. C] looks too much like a soft round figure to be taken seriously). This reckoning is well in line with the other comparison between the earnings of craftsmen and sophists in the Socratic dialogues. Socrates says in the *Menon* (91d) that he knows "Protagoras made more money from that wisdom of his than did Phidias and ten other statuary." If we allow Protagoras peak-earnings of no more than 13,000 dr. per annum (which would still be only 30 percent more than the 100 minas given him by Diogenes for a single student), Socrates' comparison would be sustained if

Phidias and ten other statuary" were earning as much as 1,100 dr. on the average (which would allow much more for Phidias than for most of the rest), i.e., considerably more than would be required by Erechtheum figures cited in n. 116 above.

I went to Sicily once while Protagoras was residing there (*epidemountos autothi*) and enjoying a great reputation. Though he was much the older of the two of us, I made in a short time much more than 150 minas. . . . I rather think I have earned almost twice as much as have any two other sophists you might care to mention (282d-e)

If Hippias, bragging of his success in the Sicilian market, reports his total take at "much more than 150 minas" (presumably not very much more, else he would have named a higher round number), while representing himself as having earned "almost twice as much" as any two other sophists picked at random, the notion that Protagoras had been in the habit of collecting 100 minas from a single student is obviously fantastic.¹²³ So there is even [160] less reason to take it seriously in the case of Zeno on the strength of our text in *I Alcibiades*, whose authority is already doubly suspect on the grounds mentioned above. That the author should have made Zeno a present of this grandiose figure when casting him as a sophist is a good reason for distrusting the veracity of the whole of his little tale. Therewith the allegation that Zeno was a practicing sophist loses its sole claim to creditable support in the ancient literature.

BIBLIOGRAPHY

- Ast, D. Friedrich, *Lexicon Platonicum* (first edition, 1835; reprinted, Berlin, 1908). Abbreviated to "Ast."
- Boeckh, Augustus, *The Public Economy of the Athenians*, tr. by G. C. Lewis (London, 1842).
- Burnet, John, *Plato's EUTHYPHRO, APOLOGY, and CRITO*, edited with notes (Oxford, 1924).
- , *Early Greek Philosophy* (fourth ed., London, 1930).
- Calogero, Guido, *Studi sull'eleatismo* (Rome, 1932).
- Campbell, Lewis, *The SOPHISTES and POLITICUS of Plato* (Oxford, 1867).
- Cherniss, Harold, "Plato (1950-1957)," *Lustrum* 1960, Band 4.
- Clark, Pamela, "The Greater Alcibiades," *CQ* 5 (1955), 231-40.

¹²³ A similar argument against the 100 mina fee Diodorus Siculus gave Gorgias can be premised on the fact that Gorgias, though highly successful in his trade, is known to have left an estate of only a thousand staters [= 20,000 drachmae] (Isocrates, *Anr.* 156), while Isocrates charging fees one tenth the size is said "to have made more money than any other sophist, so that he was even a trierarch" ([Plut.] *Mor.* 837C). It is true that fees of instruction were not the whole source of Isocrates' income: "he not only collected money from his pupils but also received from Nicocles, king of Cyprus, son of Evagoras, twenty talents for the oration written in his honour" (ibid. 838A). But his teaching was the main, and the only regular, source of his income. If he had been so fortunate as to collect 100 mina fees from pupils, he would have quickly become richer from this source alone than the very tyrants whose subventions he courted.

- Cornford, F. M., *Plato and Parmenides*. Translation, with introduction and running commentary, of Parmenides' *Way of Truth* and Plato's *Parmenides* (London, 1939).
- Crombie, I. M., *Examination of Plato's Doctrines*, II, *Plato on Knowledge and Reality* (London, 1963).
- Diès, Auguste, *Platon, PARMENIDE*, Vol. 8, part 1. of *Platon, Oeuvres Completes* (Paris, 1923).
- Dodds, E. R., *Plato's GORGIAS* (Oxford, 1959).
- Frankel, H., "Zeno of Elea's Attacks on Plurality," *AJP* 63 (1942), 1-25, 193-206.
- Friedlander, Paul, *Plato*, II (New York, 1964).
- Fritz, Kurt von, *Grundprobleme der Geschichte der antiken Wissenschaft* (Berlin, 1971).
- , "Zenon von Elea," *RE*, Zweite Reihe, Neunzehnter Halbband, 1972, 53-83.
- Guthrie, W.K.C., *A History of Greek Philosophy*, 1, *The Earlier Presocratics and the Pythagoreans* (Cambridge, 1962); 2, *The Presocratic Tradition from Parmenides to Democritus* (Cambridge, 1965); 3, *The Fifth-Century Enlightenment* (Cambridge, 1969).
- Hamilton, Edith, and Cairns, Huntington, *The Collected Dialogues of Plato* (New York, 1961).
- Harrison, E. L., "Was Gorgias a Sophist?" *Phoenix* 18 (1964), 183-92.
- Heidel, W. A., *Pseudo-Platonica*, dissertation (Baltimore, 1896).
- , "The Pythagoreans and Greek Mathematics," *AJP*, 61 (1940), 1ff.
- Hicks, R. D., *Diogenes Laertius' "Lives of Eminent Philosophers,"* translated into English (London: vol. 1, 1925; vol. 2, 1931).
- Kahn, C., *Anaximander and the Origins of Greek Cosmology* (New York, 1960).
- Kleingünther, A., *Prötos Heuretēs, Philologus*, Suppl. Vol. 26 (1934).
- Lee, H.D.P., *Zeno of Elea* (Cambridge, 1936).
- Mourelatos, A.P.D., *The Route of Parmenides* (New Haven, Conn., 1970).
- Nestlé, Wilhelm, *Vom Mythos zum Logos* (2nd ed., Stuttgart, 1942).
- Owen, G.E.L., "Eleatic Questions," *CQ* 10 (1960), 84-102 (rpt. in Furley and Allen, vol. 2, 48-81).
- Robinson, R., *Plato's Earlier Dialectic* (2nd ed., Oxford, 1953).
- Shorey, P., *What Plato Said* (Chicago, 1933).
- Solmsen, Fr., "The 'Eleatic One' in Melissus," *Mededeelingen Nederlandse Akademie* 32 (1969) 221-33.
- , "The Tradition about Zeno of Elea Reexamined," *Phronesis* 16 (1971), 116-41.
- Stokes, M. C., *One and Many in Presocratic Philosophy* (Cambridge, Mass., 1971).
- De Strycker, E., "Le Premier Alcibiade," in J. Bidez, *Eos* (Brussels, 1945), 101ff.
- Taran, L., *Parmenides* (Princeton, 1965).
- Taylor, A. E., *Plato's PARMENIDES* (Oxford, 1934).
- Tod, M. N., "The Economic Background of the Fifth Century," *Cambridge Ancient History*, 5 (Cambridge 1927), ch. 7, pp. 1-32.
- Untersteiner, M., *Zenone* (Florence 1963).
- Vlastos, Gregory, review of Frankel's *Wege und Formen frühgriechischen Denkens*, *Gnomon* 31 (1959a), 193ff. (**1.164ff.)
- , review of Kirk and Raven, *The Presocratic Philosophers*, *PR* 68 (1959b), 531ff.

- , "A Note on Zeno's Arrow," *Phronesis*, 11 (1966), 3–18 (**1.205ff.).
- , "Zeno of Elea," *Encyclopedia of Philosophy* (New York, 1967), 8, 369–79 (**1.241ff.).
- , "A Zenonian Argument Against Plurality," in *Essays in Ancient Greek Philosophy*, ed. J. P. Anton and G. L. Kustas (Albany N.Y., 1971) (**1.219ff.).
- , *Platonic Studies* (Princeton, 1973).
- Zeller, Eduard, *Die Philosophie der Griechen*, Vol. 1, Part 1 (7th ed., Leipzig, 1923), Vol. 1, Part 2 (6th ed., Leipzig, 1920).

PART FOUR

THE PLURALISTS

THE PHYSICAL THEORY OF ANAXAGORAS

NO PRESOCRATIC SYSTEM has been studied more intensively than that of Anaxagoras, and none with better reason since by common consent it is one of the most brilliant products of the great age of Greek speculation. Tannery, Burnet, Giussani, Bailey, Cornford, Peck, and many others have labored to reconstruct it.¹ Many of the details have been clarified by their researches. But no consensus of belief has yet been reached on the main lines of the system. The extent of the disagreement is wider and

From *PR* 59 (1950): 31–57, reprinted in Furley and Allen II, pp. 323–53, with revisions, and in V. P. D. Mourelatos, ed., *The Pre-Socratics: A Collection of Critical Essays* (Garden City, N.Y.: Anchor, 1974), pp. 459–88, following the revised version. Used by permission. Minor changes have been made in spelling. Footnote numbering is as in Mourelatos, keeping the numbers of the original.

[Author's note: I regret that I have not yet had the opportunity to make the fresh study of the fragments which I would need to make if I were to attempt to revise this paper in the light of subsequent discussions of Anaxagoras. I have added a few additional comments in two new footnotes, 65a and 72a. In the course of these, I refer to the following publications by author's name only: W. K. C. Guthrie, *A History of Greek Philosophy*, vol. 2 (Cambridge, 1965); R. Mathewson, "Aristotle and Anaxagoras: An Examination," *CQ*, N.S. 8 (1958), 67–81; C. Strang, "The Physical Theory of Anaxagoras," *AGP*, 45 (1963), 101–18.]

I have made no substantive changes in the text, with one exception: I have eliminated references to "the infinitesimal" and even to "the infinitely small" in Anaxagoras. As I have since come to see (in the course of trying to thread my way through Zeno's paradoxes), the notion of the "infinitesimal" is a confused one, and even the expression "infinitely small" is misleading. There is some excuse for using the latter, since Anaxagoras himself said practically the same thing in such a phrase as *smikron apeiron ên*. There is none whatever for using the former, for there is absolutely no basis in the fragments for thinking that Anaxagoras was guilty of the confusions epitomized by that term. In B3 he gives us an admirably precise statement of what he means ("of the small there is no smallest, but always a smaller"), and I have retained his wording wherever possible. I have also spoken of his "principle of continuity," an expression which ties his rejection of the existence of smallest quantities in B1 and B3 to his denial of the discrete substances in B6 and B7.

For the rest, I should warn the reader that the solution I offer to the problem discussed in Section III is admittedly conjectural. I do not pretend that there is evidence that this was Anaxagoras' own solution to the problem. All I claim is that it is consistent with what I take to be the explicit assertions of his theory, falls well within the limits of possibility for a man of Anaxagoras' intellectual powers working with the logical and mathematical techniques available to him at the time, and constitutes a reasonable solution to the problem.

¹ P. Tannery, *Pour l'histoire de la science hellène*, 2nd ed. (Paris, 1930); J. Burnet, *Early Greek Philosophy*, [4th ed. (London, 1930; the pagination is identical with that of the 3rd ed. of 1920)]; C. Giussani, *Lucretius* (Turin, 1896), Book I, Excursus III, pp. 147ff.; C. Bailey, *Greek Atomists and Epicurus* (Oxford, 1928), Appendix I; F. M. Cornford, "Anaxagoras' Theory of

sharper than one would ever guess from the complacent simplifications of the schoolbooks.² Cyril Bailey, who offered some years ago an original interpretation of the system, now concedes that "as yet no solution seems to have been reached which is both tenable in itself and will tally with the extant fragments."³ The present reconstruction is offered in the hope that the problem, however formidable, is not insoluble.⁴ It proceeds by way of a fresh examination of the relevant fragments, seeking to comprehend them first of all by comparison with contemporary doctrines, especially that of Empedocles. It is guided throughout by the conviction that Anaxagoras can be understood only in terms of his [31] immediate philosophical heritage that defined the problems he tried to solve and equipped him with assumptions that are presupposed in his boldest innovations.

I. THE SEEDS

In the primordial mixture "there was much earth and an infinite multitude of seeds in no way resembling one another."⁵ In all subsequent parts of the mixture,⁶ "there must be many things of all sorts and seeds of all things having all sorts of forms⁷ and colors and savors."⁸ In these lines we encounter the only new term that the surviving fragments of Anaxagoras introduce into

Matter," *CQ*, 24 (1930), 14ff. and 83ff.; A. L. Peck, *Anaxagoras and the Parts*, "CQ" 20 (1926), 57ff.; "Anaxagoras: Predication as a Problem in Physics," *CQ* 25 (1931), 27ff. and 112ff. To the first, second, fourth, and fifth of these and to the second of Peck's studies I shall refer hereafter by the author's name. All references to the fragments of the pre-Socratics are as in DK.

² The latest and best of the textbook accounts—K. Freeman, *Companion to the Pre-Socratic Philosophers* (Oxford, 1946)—follows Cornford's interpretation, but without so much as a mention of the major difficulty which besets this particular view.

³ In his commentary on Lucretius (Oxford, 1947), II, 743. He is referring to the impasse between the two contradictory theories which will be discussed in Section III, below, [pp. 320ff.].

⁴ I am indebted to [my colleagues,] Friedrich Solmsen and Max Black, for some valuable suggestions which I have incorporated into this paper.

⁵ B4, *ad fin*.

⁶ Literally, "in all the things that are coming together (or combining)," ἐν πᾶσι τοῖς συντινόμεναις. Cornford's alternative interpretation of this expression will be discussed in Section III, below.

⁷ Burnet and others render this as "shapes." *Idea* may, but need not, mean "shape." It is as general as the English word "form," which need not refer at all to physical configuration. So, e.g., Democritus B11, "two forms (*ideai*) of knowledge." In the medical literature *idea* is used to denote the qualities or "powers" of a given thing; cf. the expression "form" (*idea*) and "power" (*dynamis*) in *Nature of Man* 2.7–8 and 5.15–16 (*Hippocrates*, ed. W.H.S. Jones, Vol. IV), and *ideas* in *ibid.*, 5.7. In the last of these, it is perfectly clear that the *idea* of blood is its nature, i.e., the sum total of the specific properties by which blood is observably different from another substance, bile. The use of *idea* in Empedocles B 35 17 and Diogenes B6 is equally general.

⁸ B4, *ad init*.

the technical vocabulary of Greek cosmology.⁹ His other technical terms—mixture, segregation, composition, and the rest—are strikingly traditional.¹⁰ They go back to the beginnings of Ionian physics; in all probability [32] they are as old as Anaximander.¹¹ But no one before Anaxagoras had ever used "seed" as he did,¹² while after him the term became current in physical terminology. The atomists took it up. They speak of their atoms as seeds,¹³ and Aristotle refers to the primordial atomic mass in Leucippus and Democritus as a "seed-aggregate," *panspermia*.¹⁴ The innovation is so radical that one may well sympathize with those commentators¹⁵ who refuse to believe that Anaxagoras could have really meant to stretch the word so far beyond its ordinary sense, applying it to inorganic, as well as organic, matter. But the context makes it perfectly clear that the term is employed with unrestricted generality.

⁹ I say this without prejudice to the authenticity of *homoiomereia* as an Anaxagorean innovation, since the latter does not, of course, occur in the fragments (see below, Section II *ad fin*). To these mentions of seeds in B4, we may add Arist. *De caelo* 302b2, where Anaxagoras' seeds are "flesh, bone, and the like," and *De gen. et cor.* 314a28, where Anaxagoras is said to hold that earth, fire, water, air are "seed aggregates" (*panspermia*) of all the *homoiomere*, "flesh, bone, and the like." Cherniss' alternative rendering of the latter passage (*Aristotle's Criticism of Pre-Socratic Philosophy* [Baltimore, 1935], p. 108n.444) is a perfectly possible one, but immaterial for my interpretation of Aristotle's account of Anaxagoras.

¹⁰ I do not mean, of course, that Anaxagoras did not recast the meaning of these terms and will explain in due course how he did. I am only saying that none of them involves a terminological innovation. I may remark in passing that Bailey's view (546ff.) that *summixis* is employed in a radically different sense from *sunkristis* has no foundation in the fragments and is incompatible with the juxtaposition of *summixetai* and *apokrinetai* in B17 (cf. B12) as correlative contraries.

¹¹ [See Anaximander A9] [Arist. *Phys.* 187a20–21; *Simpl. Phys.* 24.23–25]. Though these are, of course, paraphrases, the terms *apokrinomenon* and *ekkrinesthai* are in all probability Anaximander's own. What other words could he have used to express these ideas?

¹² I am not ignoring such expressions as "seed of fire" in the poets (e.g., *Od.* 5.490, Pindar *Pan.* 3.37). By obvious metaphor "seed" could be used for the causal beginnings of any process, physical or social, as much as biological. Thus *sperma kai rhiza* is used in Demosthenes 25 48, and there is every reason to think that this, like *archē kai rhiza*, *pēgē kai rhiza*, or *archē kai pēgē*, was a fairly common expression. I am merely insisting, so far as we know, that Anaxagoras was the first cosmologist to use this term not in this vague and general fashion, but as a precise and scientific concept. I know of only one exception to my statement, the use of "seed" in Aristotle's discussion of Pythagorean doctrine in *Met.* 1091a16, but (a) this is not directly ascribed to Pythagorean vocabulary, and (b) even if it were, there would be no evidence for placing it in the earlier, pre-Anaxagorean phase of Pythagorean doctrine, while (c) we know of no Pythagorean doctrine that would give a technical meaning to this term.

¹³ Epicurus *Ep.* I 38, 74, and 89. All three passages refer to "seeds" of all things, including inanimate objects. So too in Lucretius I.59 *et passim*, *semina rerum* has the same denotation as *materies*, *genitalia*, *corpora*, *corpora prima*. The Empedoclean *radices* is also borrowed by Lucretius for the same purpose (II 203). See Bailey, *Greek Atomists and Epicurus*, pp. 343ff.

¹⁴ *Phys.* 203a21; *De caelo* 303a16, *De an.* 404a4.

¹⁵ For example, Cornford and Peck. In his first paper ("Anaxagoras and the Parts," p. 70) Peck went further to assume that even "parts" (which he takes as equivalent in denotation with "seeds") refers only to the parts of organic creatures.

There are "seeds of *all things*" in all the products of the cosmogonic process; and wherever the expression "all things" occurs in the fragments, it means just what it says;¹⁶ it would be forcing the texts to take it in any other way. And this is confirmed by the reference to the earth in connection with the "infinite multitude of seeds."¹⁷ [33]

A departure of this magnitude could not have been made carelessly. Unlike "root" in Empedocles, it cannot be discounted as poetic license. Hesiod had spoken of the "roots" of the earth,¹⁸ and Xenophanes had echoed the expression in a sense which is obviously metaphorical.¹⁹ Empedocles borrows the term along with so many other turns of poetic diction to which he clearly attaches no literal significance. But Anaxagoras is a prose writer, not a poet; and his prose is singularly sober, the spare idiom of logic and physical inquiry. When he used the term "seed," he would do so with due regard to the proper meaning of the word in its ordinary biological context. To find that meaning, we must ask what it was that his own scientific contemporaries understood a seed to be.

The general view among philosophers and medical men alike is clear enough.²⁰ A seed is a compound of all the essential constituents of the parent

¹⁶ B1, B4, B12. That *chrēmata* may denote either the qualities (hot-cold, etc.) or the seeds or both does not, of course, detract from the force of my contention.

¹⁷ As Cherniss points out, καὶ γῆς πολλῆς ἐνεούσης καὶ σπερμάτων ἀπειρίων πλήθος, etc., "is a genitive absolute giving the cause for the preceding statement" (*Aristotle's Criticism of Pre-Socratic Philosophy*, p. 401); that is to say, the "mixture of all things, of the moist and the dry, etc." is explained by the presence of an infinite variety of seeds (each of which, as will be made clear in Section II, consists of the moist-dry, hot-cold, etc., in varying proportions). There is no satisfactory explanation of the mention of earth in this connection unless earth were one variety of seed. This interpretation is supported by the immediately following sentence: "For neither did any of the others (*tōn allōn*) in any way resemble one another." *Tōn allōn* here must refer to *spermata* in the preceding sentence; it cannot refer to the moist-dry, hot-cold, etc., of that sentence, because (a) these opposites are so obviously different that there is no sense in roundly affirming that they do not resemble each other, and (b) the parallel declaration in B12 ("for no other thing [*sc.*, other than *nous*] is like any other") clearly refers to composite bodies (compounds of the moist-dry, hot-cold, etc.) which, as we shall see, can only be the seeds. Now if the reference of *tōn allōn* is to *spermata*, the sense can only be "neither did any of the seeds (other than the earth) resemble one another," which would clinch my contention that the earth is here spoken of as a seed. The only positive evidence to the contrary is Aristotle's round affirmation that the earth (as well as fire, air, water) were not Anaxagorean "elements," but only "seed-aggregates" (*De gen. et cor.* 314a25ff.; cf. *De caelo* 302a28ff.). I believe that this is an Aristotelian misunderstanding; it will be fully discussed in Section III.

¹⁸ *Op.* 19, *Theog.* 728.

¹⁹ *Arist. De caelo* 294a23, assuming that *ep' apeiron errizōsthai* is quoted from Xenophanes. The Pythagorean description of the *tetrakys* (B15) as "source and root of eternal nature" is also in metrical form.

²⁰ See especially the Hippocratic treatises on *The Germ*, *Nature of the Child*, *Diseases IV*.32-34, and *Airs, Waters, Places* 14, *Arist. De gen. anim.* 721b7ff., 763b30ff.; *Aetius* 5.3.3 and 6; *Censorinus* 5.2 and 3.

body from which it comes and of the new organism into which it will grow. In its ovular or uterine environment (or, in the case of vegetable seeds, in the earth), the compound grows on the principle of "like to like,"²¹ each ingredient of the seed being "nourished" [34] by bits of the same stuff supplied by its environment. That this is Anaxagoras' own notion of a "seed" is what we would expect; and the expectation is confirmed explicitly in B10:²²

For in the same germ [he said] there are hair, nails, veins, arteries, sinews, bones, which are not manifest because of the smallness of [their] parts, but become distinct little by little as they grow, "For how," he says, "could hair come from not-hair, or flesh from not-flesh?"

Here we have, strictly speaking, only a theory of the generation of the offspring from the seed, *sc.* that the seed contains all the essential tissues of the offspring (the "pre-formation" theory). But the same reasoning would apply no less to the current theory of the generation of the seed from the parent-body, *sc.* that the seed contains all the essential tissues of the parent-body (the "pan-genesis" theory). The two are complementary, and Anaxagoras could justify both by the same general principle that "hair cannot come from not-hair, nor flesh from not-flesh." Anaxagoras' theory of nutrition²³ is similarly complementary to the theory of the seed, enabling him to explain the growth of the seed in egg, womb, or earth, and is similarly deducible from the same

See *Nature of the Child* 17 and 22; *Diseases IV*.34.

²¹ To this fragment we might add the unnamed view of the germ in *Arist. De gen. an.* 769a28ff. This is in all probability the theory of Anaxagoras, since it is given as an alternative to the view of Empedocles, Democritus, and others (769a7ff.), while earlier (763b30ff.) Anaxagoras had been named as the author of the theory of generation opposed to that of Empedocles, Democritus, and others. The present view is that

the semen, though a unity, is as it were a "seed-aggregate" consisting of a large number of ingredients. It is as though someone were to mix together many humors in one fluid and then could take thence (*sc.*, some of the ingredients), not always an equal amount of each, but sometimes more of this one, sometimes more of that, and sometimes some of one and none of another. So, they say, it is with the semen, which is a mixture of many ingredients. And the offspring will resemble the form of that one of the parents from which the most (*sc.*, of the several ingredients) is derived.

Ἀπ' οὗ . . . πλείστον ἐγγένηται in the last sentence cannot mean "from which most of the semen is derived," since the codetermination of the semen from male and female is the theory of Empedocles and Democritus to which the present theory is contrasted. It can only mean "from which the most of each of the ingredients of the embryo is derived," i.e., that the kind of nourishment provided by the mother in the uterus will be a codeterminant of the constitution of the offspring equally with the kind of semen provided by the father. This is the only ground on which Anaxagoras—who held that the semen comes from the father alone—could account for cases where the offspring "takes after" the mother rather than the father (*Censorinus* 6.4, *Anaxagoras autem eius parentis faciem referre liberos indicavit, qui seminis amplius contulisset*, must be a misunderstanding.)

²³ *Aet.* 1.3.5; *Simpl. Phys.* 460 15-19, *Lucr.* 1 861-67, *Arist. De gen. an.* 723a11.

principle that "hair cannot come from not-hair"; if hair is nourished by the consumption of bread or flesh, hair must have [35] pre-existed in bread and flesh. Thus when Anaxagoras speaks of "seeds" of all kinds of things, pre-existing in the primitive mixture and persisting in each of its products, he must mean that all these things are contained in their causal antecedents, just as all the parts of a man are contained in the sperm and all the parts of a plant are contained in its seed. Whatever is generated from a seed was in the seed. Biological generation is only the separating out of things which were mixed together in seed and nutriment; imperceptible in the mixture, they became "manifest" through a process of segregation and recombination. When Anaxagoras through the concept of the *seed* generalizes this principle of germination from biology to cosmology, extending it to any process of generation whatever, he is seeking to convey a new idea for which none of the traditional terms offered a fitting vehicle. What is this new idea?

There is nothing new about the notion of a mixture whence things are generated by segregation and recombination. This goes back to the beginnings of Ionian speculation. Anaximander's generation of the world from the *apeiron* was founded on this idea [1], and so too, in its own way, was Anaximenes' hypothesis of the creation of the world by successive segregations of the rare and dense components which were uniformly blended in the original substance, air.²⁴ Parmenidean logic had necessitated [a] {its} recasting [of this idea] in conformity with the requirements of the new concept of Being.²⁵ If whatever *is* is unalterably, then whatever is now must have *been* in the primitive mixture; whatever properties are part of its being it must possess eternally, in the original mixture as much as out of it ever after. Parmenides himself had pointed the way by which this idea could be applied to cosmology,²⁶ and Empedocles had followed it with unprecedented rigor [36] and systematic completeness. The general formula that there is no absolute generation or destruction, that becoming and perishing are mere "names," that really there is only "mixture and interchange of things mixed" had been stated by Empedocles (B8). Was Anaxagoras then only parroting Empedocles when he asserted the same principle in almost exactly the same words in B17? It is

²⁴ [The description of Anaximenes' air in A7 (Hippol. Ref. 1.7.2) agrees with the traditional concept of a mixture whose components become "manifest" when separated out. Cf. *Ancient Medicine* 14.35ff. and the account in *Airs, Waters, Places* 8 of the rarefaction of water and air as the separation (*ekkrinetai*, line 31) of the light, sweet, fine, bright components from their respective opposites (both as in Jones, *Hippocrates*, Vol. I). And see Cherniss, *Aristotle's Criticism of Pre-Socratic Philosophy*, pp. 379-80. [See n. 11, above.]

²⁵ See my "Equality and Justice in Early Greek Cosmologies," *CP* 42 (1947), 161 (*1.64).

²⁶ By his assumption of two opposite forms of being, each with its own self-identical powers, "in every way the same as itself, and not the same as the other" (B8.57-58). [We have, of course, no surviving account of a primitive mixture of these opposites. But it is unlikely that he departed in this respect from the traditional pattern, and there is a hint of it in the origin of sun and moon by *apokrisis* from the mixture of the two forms in the Milky Way (A43 and 43a).]

at just this point, where he is closest to Empedocles, that we must look for the real difference and for the true originality of his physics.

To apply the concept of being to the world of becoming, Parmenides and Empedocles had to make an *ad hoc* hypothesis. They were forced to assume that of all the vast variety of known substances, only a small number—two and four respectively—could claim the title of Being. They, and they alone, were truly self-identical, unalterably unmixed.²⁷ Bone, flesh, and everything else had no being; they were only mixtures, whose very birth carried with it the certainty of eventual death. As an imaginative transformation of both the popular world view and of its philosophical reconstruction, this had the most far-reaching consequences. The abyss which traditional religion had fixed between gods and men now yawned within the visible world itself, dividing it up into two classes of things, the one original and everlasting, the other derivative and temporary,²⁸ the one immortal, the other mortal.²⁹ Empedocles was not ashamed of this conclusion. He proudly proclaimed the divinity of his roots, giving them the names [37] of the gods.³⁰ This was his challenge to the scientific world, no less than to common sense, and we can still gauge its power both from the violence of the opposition which it provoked³¹ and from the enormous influence it exerted.³² To this challenge Anaxagoras addresses

²⁷ *Hēnekes aien homota* (B 17.35), like Parmenidean Being which was *pan homoton* (Parm. B8.22, Melissus B7). From *Ancient Medicine* we can get a good idea of what it was in Empedocles that struck (in this case, shocked) his contemporary audience. It was the doctrine that earth, fire, etc., have "pure," unmixed being. See below, Section II, p. 315.

²⁸ The Ionians too had divided up nature into a divine original (Anaximander's *apeiron*, Anaximenes' air) and mortal creatures. But the division had never been as sharp as in Empedocles, since the very substance of the divine original was transformed into its mortal creatures throughout the cosmogonic process. The trend in Ionian had been to bridge the gap. Heraclitus proclaimed that *this* world was everlasting (B30), the opposition between mortals and immortals is abolished (B62); all things are one (B50), and opposite things are "one and the same" (B60, B88).

²⁹ The expression "those things became mortal which had been immortal before, those things were mixed that had before been unmixed" (B35.14ff.) does not, of course, mean that the four roots themselves became "mixed" and "mortal." In themselves they cannot become anything, they always are themselves (cf. the thrice repeated *auto estin tauta*, 17.34, 21.13, 26.3). It is their products which are mortal mixtures, mortality and mixture is predicated not of their being, but of their temporary conjunctions.

These are the real gods of Empedoclean cosmology: the traditional gods are in the same boat with men and animals, products of the roots (B21), and they are spoken of as "long-lived" (*diolichatones*), not "everlasting" (*aiēn ontēs*); only the roots *aiēn easin* (B26.12). On *dolichatōnes* see W. Jaeger, *Theology of the Early Greek Philosophers* (Oxford, 1947), p. 33 and p. 206n. 52.

³⁰ In the well known instance of *Ancient Medicine*. The author is not tilting against speculative winds but is on the defensive against an aggressive opponent who has invaded his own (medical) home ground. See especially chapter 13 *ad init.*, where he refers to those whose "researches in the art" (sc., medicine) and medical therapy are based on this newfangled hypothesis.

³¹ For example Philistion (fourth century) who still conserved the four roots in his medical system, and the (probably earlier) *Nature of Man*, whose four humors with hot, cold, dry, moist, as their respective properties, are doubtless adapted from the Empedoclean school.

himself in the first book of his treatise. When he asserts that "the contents of the one world"—whose unity had been shattered by the cosmological dualism of Parmenides and Empedocles—"are not sundered from each other, the hot from the cold, or the cold from the hot" (B8), the butt of his attack is clear and has been noticed often enough. But it has not been sufficiently noticed³³ that the detailed account of the generation of aether, air, water, earth is no less effective as Anti-Empedoclean polemic. The dogma that earth, water, air, fire can never be transformed into one another is here disposed of: air is shown to turn into water, water into earth. It was on this very exemption from intermutation and mixture that their title to being had rested in Empedocles. Anaxagoras abolishes the exemption without impairing the title. Being is no longer the exclusive privilege of four divine things, but the common possession of all things. This is the revolutionary principle of his physics.³⁴ The meaning of the proposition that [38] "things are [only] mixed together and separated out of things that have being"³⁵ has now changed, for the denotation of "things that have being" has changed. Flesh and bone, no less than earth and fire, have the property of being, though all are subject to mixture. Being and mixture are not incompatible as in Parmenides and Empedocles, but complementary. So they appear in the seed; and the two sentences in which the word *seed* is used in the surviving fragments are both expressions of this idea, both employing the new term to assert propositions never before asserted in Greek physics.

The mixture of the moist and the dry, the hot and the cold, and the rest, in the primordial matrix was an old story in Ionian speculation. But the further statement in the account of this mixture, "there being much earth in it and an infinite multitude of seeds in no way resembling one another" is new. No Ionian had ever said that earth had been "in" the original matrix. Empedocles had said just that, precisely because he had endowed earth with Parmenidean being. Anaxagoras takes a long step in the same direction. He holds that earth, air, aether, as well as hair, flesh, and every other substance are "in" the primitive mixture, for they all have Parmenidean being. Even if we had lost this particular text, we could have reconstructed the doctrine from his general principle that hair cannot come from that which is not-hair. What this text adds is the precious word *seeds*. It tells us *how* Anaxagoras conceived of the

³³ But see Tannery, p. 292.

³⁴ And was properly appreciated as such by Aristotle, in spite of his other misunderstandings of the system: *Met.* 984a8ff., in Empedocles only the four roots "persist eternally and do not become," while in Anaxagoras "nearly all the *homoiomerē*, like air and water [sc., in Empedocles], are thus generated and destroyed only by congregation and segregation, but otherwise are neither generated nor destroyed, but persist eternally." The weakening of the generality of the proposition by the initial "nearly" (*schēdon*) may be disregarded as both unwarranted and inconsistent with other passages in which Aristotle makes no qualifications to the statement that Anaxagoras' *homoiomerē* were "elements" (e.g., *De caelo* 302a28ff.); cf. Theophrastus, *apud* Simplic., *Phys.* 27.5–6, "all the *homoiomerē* are ungenerated and incorruptible."

³⁵ Literally "out of things that are," *apo eontōn chrēmātōn*.

pre-existence of all these substances in the cosmic matrix. They were there as seeds. The primitive mixture was a seed-aggregate, just as every ordinary seed is a seed-aggregate. A bit of human sperm is a mixture of flesh-seeds, hair-seeds, bone-seeds, etc. So the primordial matrix was a mixture of an "infinite multitude of seeds," earth-seeds, flesh-seeds, and the rest. The mixture was homogeneous, every part of it like every other part, since "nothing was manifest" in it.³⁶ Yet these homogeneous parts [39] were full of seeds as different from each other as earth from aether and hair from flesh, just as the ordinary seed, visibly homogeneous, is nonetheless full of heterogeneous things, resembling one another as little as a hair-seed resembles a flesh-seed.

Consider now the second proposition that each of the things that arise in the cosmogonic process "contains many things of all sorts and seeds of all things having all sorts of forms and colors and savors." Here again we have something new. The things of this created world, it is asserted, are as full of "seeds of all things," as rich in creative potency, as was the primordial infinite. And here too we have a doctrine which, in the absence of this particular text, could have been reconstructed from another fragment. For we are told in B6 that "as it was in the beginning, so now, all things are together." The things which emerge from the original mixture are mixtures in precisely the same sense. Anaxagoras could not have declared this identity more emphatically than by repeating, as he does here, his favorite phrase, "all things together," which he uses no less than three times in the surviving portions of his treatise to describe the original mixture. The mention of the "seed" simply shows how this concept duly generalized ties together the first term of the cosmogonic series with all its subsequent terms. No one would have said that an ordinary seed is a seed-aggregate of *all* substances. But the cosmic matrix must be just such a seed-aggregate, since all substances emerge from it. Similarly every part of

³⁶ This has been persistently misunderstood (Tannery, p. 299; Burnet, p. 266; Bailey, p. 546; Peck, p. 118) to say that air and aether were manifest in the primitive mixture, while nothing else was. Nothing of the kind is said in the fragment, which states emphatically that "all things being together, nothing was manifest" and proceeds to mention the predominance (*kata hen*) of air and aether not as an exception to the statement but as a *reason* for it (*gar*). (For my suggested explanation of this difficult statement, see n. 80 below.) The preceding statement that all things in the mixture were "infinite both in multitude and smallness" is also fairly general, and would apply to air and aether as much as to everything else. [That air and aether, though "infinite in smallness," are larger than other things is no contradiction. Infinitely small things are not necessarily equally small: x and y may both be infinitely small, yet x may be indefinitely larger than y . Anticipating the exposition, I may say that this idea is implied in Anaxagoras' whole theory that an infinitely small seed, containing an infinite multiplicity of ingredients, contains them in unequal ratios. What Anaxagoras is saying in the present fragment is that the only things which predominate in the mixture and might thus be 'manifest' by virtue of such predominance are aether and air, whose distinctive qualities rare-hot-bright-light and dense-cold-dark-heavy respectively offset each other so that neither can be "manifest." (See further below, Section III, at n. 80.) In this respect my interpretation of B1 agrees with Cornford's, pp. 24–26.]

every subsequent phase of the world process must be a seed-aggregate in just this sense, containing "seeds of all things."³⁷ The infinite variety of being contained in the infinite matrix [40] from which the world arose is also contained in any portion of that world.

Can the finite then contain the infinite? Here we are forced to take account of the second major innovation of Anaxagoras' physics, hitherto disregarded^[38] for the sake of expository simplicity: the concept of [the infinitely small] (the principle that given any portion of being, however, small, there always exist still smaller portions³⁸). The idea of the seed was the imaginative searchlight which brought to light a whole new world of conceptual possibilities. The idea of [the infinitely small] (continuity) was the logical compass with which Anaxagoras was able to explore these new regions and show how they could be added to the chart of intelligible truth. If "of the small there is no smallest, but always a smaller" (B3), the new idea intuitively suggested by the "world-metaphor" of the seed need never run afoul of logical absurdity. Any portion of being, however small, may contain the infinite variety of being in portions [infinitely] (sufficiently) small. Any two things, however small, may now be shown to be both alike, since they contain "portions of everything," and unlike, if they contain these portions in unequal ratios. Fuller discussion of this part of the system must await clarification of the further question, What are these "portions" of the seed?

II. [THE POWERS] (THE OPPOSITES)

The correct answer, and therewith the most important step ever taken toward the true understanding of Anaxagoras, was made by Tannery's suggestion that the ultimate ingredients of the seeds are the hot and the cold, the dry and the moist, and all the traditional "opposites" of Ionian cosmology.³⁹ These are

³⁷ The similarity is borne out by the parallelism between the description of the germ in B10 and of the precosmic state in B1. In both cases we have a mixture of parts of which none is manifest (*ouden endêlon*, B1; *aphanê* B10) because of their "smallness" (*hupo mikrotêtos* B1; *dia mikromereian*, B10). Cornford has drawn attention (pp. 21ff.) to the valuable passage where Simplicius (*Phys.* 460.28ff.) even tells us that Anaxagoras "passed from the mixture in the individual thing to the mixture of all things." Anaxagoras would not have, of course, derived from the seed the general idea of the origin of the world from a primitive mixture, which was wholly traditional. What he may well have derived from it was, as I have suggested, the specific idea of the preformation of all things in the original mixture on the model of the preformation of all the tissues in the organic seed.

³⁸ [Except in n. 36 above.] (B1, B3, B6)

³⁹ Tannery's account of the scientific scope of Anaxagoras' theory of matter, as a perfectly logical alternative to the atomic hypothesis, is still the best. There is only one major confusion in his reconstruction: he first assumes that Anaxagoras' qualities are "pure abstractions" (p. 295), but then (pp. 298 ff.) reverts to the (correct) view that the distinction between substance and qualities

conceived not as [abstract Aristotelian predicates] (properties of Aristotelian substances), but as [substantial] "quality-things"⁴⁰ [41] or, better still, as forms of energy or "power" (*dunamis*). Long before Plato coined the technical term *poioies*,⁴¹ the current term for "quality" was *dunamis*, power.⁴² The hot is that which heats, the moist that which moistens; each is an active tendency to change other things after its own fashion, unless checked, or balanced, by its opposite.⁴³ Sensation itself is conceived as just such a change in the percipient. I perceive anything as hot so far, and only so far, as that thing heats me, the effect on the sensitive organism being exactly the same as that on all other bodies.⁴⁴

As to the number of these powers, the general assumption seems to have been that it was indefinitely large.⁴⁵ The hot and the cold, the dry and the moist, the rare and the dense, the bright and the dark are, of course, more prominent than any others in cosmological inquiry. But these others would be no less real and substantial. The "sweet" and the "bitter" figure in Alcmaeon's list of powers whose equipoise constitute health. For the physiologist and the medical man, such gustatory qualities would be extremely significant. "It is not the hot which possesses the great power," says the author of *Ancient Medicine* in his polemic against Empedocles, "but the astringent, the insipid and the other [gustatory] qualities I have mentioned, both in man and out of

is not to be found in Anaxagoras. The uncertainty could have been cleared up and the historicity of the latter view firmly established against Zeller's objections by a study of the qualities as substantial "powers" in the Hippocratic literature.

⁴⁰ The term is Cornford's.

⁴¹ *Theaet.* 182a.

⁴² So, e.g., in Alcmaeon B4, Parmenides B9 2 and 18.2-4, and generally in the Hippocratic treatises.

⁴³ I cannot understand what leads Peck to say, "There is no notion here [sc., in the Hippocratic usage of *dunamis* in the sense of 'strong substance' of a particular character] of the substance having power in the sense of power to affect an external body in a particular way" (Introduction to Aristotle's *Parts of Animals* [Loeb ed.] p. 31). This is just the sense in the Hippocratics from the very start: see e.g., *Ancient Medicine* 15, "the hot-astringent will produce exactly just such an effect, the cold-astringent the opposite effect, and this not only in man but in a leathern vessel and in wood and in many other things less sensitive than man." The whole theory of the admissibility of drugs or slaps depends on just this assumption: that it has a given set of powers, it will affect the patient in just these ways and in proportion to the intensity of its own powers. Peck's other remarks on *dunamis*, both here and in his Introduction to Aristotle's *Generation of Animals* [Loeb ed.] pp. xlixff., seem to me both accurate and illuminating.

⁴⁴ See e.g., *Sacred Disease* 16.

⁴⁵ *Anc. Med.* 17.10, where the mention of various properties, bitter, acid, salty, is capped with the words *kai alla multa*. Aristotle (*Met.* 986a22ff.) tells us that Alcmaeon [assumed an indefinite list] did not attempt to specify a limited set of "opposites" (cf. Alcmaeon B4, moist, dry, cold, hot, bitter, sweet, and the rest) [Anaximander must have done likewise] (Neither apparently did Anaximander); *Simpl. Phys.* 150.24, "and the opposites are the hot, cold, dry, moist, and the rest."

man, whether eaten or drunk or externally applied as ointment or plaster."⁴⁶ Their importance may be gauged from the speedy dominance of the doctrine of the *chumoi*, or "humors," in medical theory, *chumos* denoting both the savor of a given substance and the substance which has that savor. In the first, formative stages of the doctrine, we can see how a specific "humor" is identified primarily by its gustatory quality. Thus, when the author of *Ancient Medicine* refers certain symptoms of "nausea, burning and weakness" to a certain humor, he speaks of it as "a certain bitterness which we call yellow bile" (19.28), while "frenzy, gnawings and distress of the bowels and chest," are referred to the presence of certain ["sharp [tasting]" substances] ["pungent and acrid acidities"] in the body (19.36).

That Anaxagoras shared the traditional view of the "powers" is a reasonable assumption, and this not in spite, but because of, the scantiness of our notices on this topic. Had he deviated in any significant way, some trace of the innovation would have been left in the record. His extant fragments speak of the hot-cold, dry-moist, rare-dense, bright-dark;⁴⁷ also of "all sorts of colors and savors."⁴⁸ Since our fragments are mainly preoccupied with cosmogony, they concentrate in the traditional fashion upon the former. The formation of the broad masses of earth, water, air, and the fire depends, as in all previous accounts, on the separation of the hot, the dry, the rare, and the bright from their respective opposites. These are the dominant, but not exclusive, properties of earth, water, air, and fire. Thus the earth contains salty savors, manifest in deposits of mineral salt and in the saltiness of seawater which has been filtered through the earth; "and there are also sharp humours in many parts of the earth."⁴⁹ Similarly the air is full of savors, though these become manifest to our senses only when concentrated by condensation.⁵⁰ What colors and savors Anaxagoras considered important we do not know.⁵¹ But it is safe to assume that he believed in an indefinite number of savors and colors. [43] This is confirmed by his statement that "in neither word nor deed can we know the number of the things that are being separated off."⁵²

⁴⁶ 15.27-30

⁴⁷ B4, B8, B12, B15, B16

⁴⁸ B4; cf. Diogenes B5, where after mentioning differences with respect to the hot, cold, etc., he adds "and there are many other differences of savor and color, an infinite number of them."

⁴⁹ A90

⁵⁰ Theophr. *De sensibus* 30 (= A92); cf. *Airs, Waters, Places* 8

⁵¹ All we know of his medical theory is Aristotle's single reference to (and refutation of) the Anaxagorean doctrine that bile is the cause of acute diseases, *De part. an.* 677a5ff

⁵² B7. For the meaning of the expression "things that are being separated off" (*tôn apokrinomenôn*), see B12, "and the rare is separated off [*apokrinetai*] from the dense and the hot from the cold and the bright from the dark and the dry from the moist"; thus it is the powers (of which only the usual four pairs are enumerated here) which are the "things that are being separated off." The meaning of *tôn apokrinomenôn* in B6 must be the same: the powers, an equal set of which is contained in all things, great and small. We have also Aristotle's testimony (*Phys.* 187a25) that the "opposites" (powers) of Anaxagoras were infinite in number, as well as the *homoiomerê*.

That none of these qualities can exist apart or "by itself," but only in commixture with others, had been the traditional assumption. So obvious a truth would never have been asserted, except in the face of its denial. The author of *Ancient Medicine* does assert it against Empedocles, protesting the outrageous dogma that "pure" qualities could ever exist "by themselves" anywhere in the world.⁵³ His very words are reminiscent of Anaxagoras' denial that anything (except mind) could ever be "by itself."⁵⁴ The doctrine that "there is a portion of everything in everything" is thus rooted in common sense, though Anaxagoras' [concept of the infinitesimal] [principle that "of the small there is no smallest"] reads far more into the commonsense view than common sense in its innocence had ever suspected. Certainly it would have never occurred to the author of *Ancient Medicine* that all the [powers] [opposites] exist in everything; and if it had, he would have asked how the same qualities could make up things so manifestly different. Anaxagoras is ready with the answer: "Each [individual] thing [is and was] most manifestly [is and was] those things of which it has most in it."⁵⁵

The form of this answer is not original in the least. The idea that the observable properties of a given thing could be explained by the proportions in which its constituent "powers" were mixed together was a familiar one.⁵⁶ Thus Empedocles had accounted for the difference between bone and flesh by specifying the different proportions in which [44] their ingredients, the same for both, were put together.⁵⁷ What is still more significant, Empedocles had appealed to variations in the "ratio of the mixture"⁵⁸ to explain not only differences between different substances, but also differences between different kinds of the same substance. Thus blood, the organ of thought, consists of earth, water, air, fire in equal proportions; "a little more" of one or "a little less" of another ingredient would account for differences in the intellectual powers of different persons.⁵⁹

⁵³ 15.6, 19.22. A relative degree of separation is, of course, admitted as the cause of disease (14.35ff.)

⁵⁴ Compare Anaxagoras' expressions *eph' heautou genesthai* or *einai* in B6 and B12 with *auto tē eph' heautou* in *Anc. Med.* 15.6

⁵⁵ B12, *ad fin.*

⁵⁶ So, e.g., in Alcmaeon's doctrine of health as the equipoise of the powers (i.e., in 1:1 proportion), and Parmenides' explanation of sense perception as due to the "more" of fire or night in the organism. See my "Parmenides' Theory of Knowledge," *TAPA* 77 (1946), 66ff.] (**1 153ff.)

A78 (= *Aët.* 5.22.1), B96, and B98

⁵⁷ *Logos tes mixeōs*, *Arist. De part. an.*, 642a22

⁵⁸ B98. Theophr. *De sensibus* II (= A86). That Empedocles himself spoke of the ratio of the powers as a *logos* is not impossible. Heraclitus (B31) had used the term in the sense of "measure" and it was currently used for "proportion" both in geometry and in common speech (see LSJ, s.v. II, 1 and 2). At B96 Empedocles speaks of allotted portions or shares (*mereōn lachē*), which comes very close to Anaxagoras' term *moirai* (in fact, some of the manuscripts of Aristotle and Simplicius read *moiraōn* or *moirōn* for *mereōn*), Democritus too used *moira* - see Theophr. *de Sens.* 77

Anaxagoras could adapt the same general theory to his own concept of matter. All things, great or small, have the same set of powers;⁶⁰ but they manifest different properties because of differences in the ratio of the mixture of these same powers.⁶¹ The [concept of the infinitely small]{principle that "there is no smallest"} would enable Anaxagoras to work with ratios far more complex than the simple proportions of Empedocles' formulae and thus account for the finest shadings of difference between any two individuals, including individuals of the same kind.⁶² The "little more" and "little less" of Empedocles could now be treated not as haphazard deviations from a set formula, but as different combination-formulae, corresponding to different manifest properties. Anaxagoras could thus lay down the formal proposition that no two individuals are absolutely similar, which is exactly what he declares in the immediately preceding sentence of the present fragment: "For no other thing [*sc.* other than *nous*] is like anything else."⁶³ The general proposition [45] that no two things are absolutely unlike (B8) is thus balanced by the no less general proposition that no two things are absolutely alike. Both propositions are conceived through the principle of [the infinitely small]{continuity}.

Through the same principle Anaxagoras could conceive a third idea: the absolute homogeneity of a given thing with any of its parts, however small. If we take, say, a bit of flesh which manifests such and such properties and proceed by mechanical division, each of the resulting sections could "manifest" exactly the same properties provided that the combination-formula characteristic of the whole were exactly the same for each of the parts; and even when we come down to parts too small to "manifest" any properties, they would still *have* the same qualities, if they be ordered in the same ratio. The principle of [the infinitely small]{continuity} would make possible just such a conception; for no matter how slight the predominance of, say, hot to cold might be in the whole, the same ratio could be maintained in any of its parts *ad infinitum*. Thus a given bone, however dissimilar to flesh, hair, and every other thing in the world, including other kinds of bone, could be internally homogeneous through and through, retaining its characteristic properties throughout any process of division instead of suddenly breaking apart {at a

⁶⁰ Their "shares" or "allotments" (*moirai*), B6, B11, B12. Cf. Plato *Phil.* 53a7.

⁶¹ Since the qualitative ingredients are indefinitely numerous, the ratio of the mixture would have to be expressed not as a ratio of part to whole but as a ratio of each power to its specific opposite: white to black, hot to cold, sweet to bitter, etc.; and only those ratios would be given which would be presumed to account for the "manifest" properties of a given substance.

⁶² This difficulty in Empedocles' physiology must have been obvious (see, e.g., pseudo-Arist. *de Spiritu* 485b26ff.)

⁶³ The same assertion in B12 *ad fin.*, cited above, Section 1, n. 3. Diogenes may "have been influenced at this point by Anaxagoras when he insisted that "none of the things which are differentiated can become exactly alike one with another, unless they become the same thing" (B5). He applies the proposition universally, rejecting the single exception to the rule that Anaxagoras had made in the case of mind (Anaxagoras B12, "but mind is all alike, both the lesser and the greater").

terminal step in the division}, as it would in Empedocles, into three other things, qualitatively heterogeneous with the next larger parts. *Homoiomereia*—similarity of parts—would be the perfect term for this principle.⁶⁴ Our fragments, of course, contain no mention of this term nor any statement of the principle. But the fact that "the *homoiomereia* [46] of things" is so generally taken by our ancient authorities as the distinctive concept of Anaxagoras' physics⁶⁵ is, I believe, sufficient evidence of the genuineness of the principle, if not also of the term.^(65a)

We may now restate the foregoing interpretation of Anaxagoras' theory of matter. It is based on a traditional concept of the "powers" and an original concept of the "seed." The two are combined through his own unique principle [of the physical reality of the infinitely small]{that there are no smallest quantities in nature}, which enables him to conserve yet transform the traditional notion of mixture and propound a new, continuous view of nature. For expository convenience the two ideas of the powers and the seeds have been treated separately. No such disjunction is, of course, presumed in Anaxagoras' own account of his system, where the two are complementary and interdependent. Every seed has all the powers. Dissimilar seeds contain dissimilar ratios of the same powers. There is an infinite variety of seeds, since there is an infinite variety of ratios in which the powers may be combined. Every seed has *being*: no seed can be generated or destroyed. Hair can only come from hair; a specific type of hair (say, blond, soft, light, etc.) can only

⁶⁴ Peck has a different interpretation, taking *homoiomereia* to refer to the fact that any two substances contain "similar parts," since each contains the same set of ingredients. But if this were the original meaning, how account for the fact that it is never adopted, or even considered, by any of the ancient commentators? How can we, in the absence of textual evidence, reject the interpretation which commended itself to those who did have access to the texts? Peck must rest his case entirely on the literal meaning of *homoiomereia*; but this agrees with the traditional interpretation much better than with his. When Anaxagoras compares different substances with respect to the same set of portions contained in each, he speaks of the *equality*, not *similarity*, of their portions. B3, the large thing is "equal to the small in respect of the multitude" (*sc.*, of the portions contained in each), cf. B6.

⁶⁵ Lucr. 1.834, "rerum quam dicit homoeomerian." Aët. 1.3.5, ἀρχαὶ τῶν ὄντων τὰς ὁμοιομερείαις ὑπεφηνάτο DL 2.8 ἀρχαὶ δὲ τὰς ὁμοιομερείαις. Plut. *Pericles* 4, νοῦν . . . ἀποκρίνοντα τὰς ὁμοιομερείαις, Galen *de Natur. Facult.* 2.8, οἱ τὰς ὁμοιομερείαις ὑποτιθέμενοι, Simplic. *Phys.* 460.4 *et passim*.

[Cf. Simplic. *Phys.* 1123.23 τὰ εἶδη, ἅπερ ὁμοιομερείαις καλεῖ—a statement entitled to respect, coming as it does from Simplicius, who knew Anaxagoras' work at first hand and quoted extensively from his book. However, many scholars have long felt reluctant to believe that Anaxagoras himself had the word *homoiomereia* or even *homoiomeres*; cf. Eduard Zeller, *A History of Greek Philosophy in the Time of Socrates*, Eng. tr. by S. F. Alleyne (London, 1881), vol. 2, pp. 335–36 and nn.; and, most recently, Mathewson, pp. 78–79. The objections are serious but not conclusive. *Homoiomeres* is, of course, one of Aristotle's favorite technical terms; but is there any reason to suppose that it is his own coinage? Epicurus uses *homoiomeres* (*Ep.* 1.52), *homoimereia* (*Peri phuseōs* XIV) in a perfectly straightforward manner, without any suggestion that he is borrowing Aristotelian idiom. For objection to the idea that even the principle of *homoimereia* is automatically Anaxagorean, see Guthrie, pp. 282ff.]

come from that specific type of hair pre-existing in sperm and nutriment and in all their causal antecedents, back to the original mixture. Any bit of matter, whether in the created world or in the primordial mixture, contains not only all the powers but also all the seeds; and any substance can grow from any other by assimilating from it its own kind of seed. Thus, in principle, "anything can be generated from anything."⁶⁶

III. EVERY POWER AND SEED IN EVERY SEED

The foregoing account, based in all essentials on the original fragments, has all but ignored the interpretations of Aristotle and his successors. It has thus avoided the problems which arise from the particular turns and twists which the doctrine of Anaxagoras suffers in the doxographic tradition. It is now time to descend to this other level of inquiry. For no responsible interpretation can ignore what is, [47] after all, a major part of the available evidence. If it departs from doxographic interpretations, it must account for the deviation and explain how ancient authors in full possession of the original texts could misconstrue their doctrine at any significant point. Misconstructions do occur, and most of them can be traced back to the distorting medium of the Aristotelian transmission. This has been amply established by modern scholarship.⁶⁷ The danger nowadays is that of overestimating the extent of the distortion and making the taint of Aristotelian influence a good excuse for dismissing any testimony that does not happen to fit our own particular preconception. Sober criticism, I believe, must approach our secondary sources with the respect due to authors who, however unhistorical in their interpretations of the evidence, had access to a vastly larger mass of it than we shall ever have. As reports on that evidence, their statements must be presumed innocent unless proved guilty.

Let us begin with the account of Anaxagoras in Lucretius 1.830ff. This tells us that all things are formed out of tiny particles of their own kind. Each is generated by the concrescence⁶⁸ or coming together⁶⁹ of small bits of its own

⁶⁶ Arist. *Phys.* 203a24, ὅτι οὐδὲν ἐξ ὁμοιοῦν γινόμενον; *Simpl. Phys.* 164.20–21 and 461.7, καὶ πᾶν ἐκ παντός ἐκκρίνεται. Here, as above, Section I, n 34, Aristotle reports correctly a fundamental doctrine of Anaxagoras.

⁶⁷ See especially Heidegger's pioneering paper, "Qualitative Change in Pre-Socratic Philosophy," *AGP* 19 (1906), 333ff., and the definitive study by Cherniss, cited above, [Section I,] n 9.

⁶⁸ *Concrescere*, 840, literally "growing together," but in this context probably the Latin rendering for Anaxagoras' *sumpēgnunai* (B 16, *sumpēgnutai gē*, here *terram concrescere*). The same word in Cicero *Acad.* 2.31 100 (under Anaxagoras A97 in DK) again as a translation of *sumpēgnunai*: snow *concreta* out of water; cf. the parallel in Sextus *Pyrh. hypoth.* 1.33, ἡ χιὼν ὕδατος ἐστὶ πεπλεγμένη.

⁶⁹ *Coeuntibus*, 837, probably for *sunienai*. Cf. Leuc. A19, *sunonta kai piloumena*; Anaxag. A81, *sunodos asterōn*; and *sunodos, sunerchesthai*, of the "coming together" of the roots in Empedocles B17.

kind: bone out of bone, blood out of blood, earth out of earth. This is what Lucretius understands by the "homoeomereia of things." He then proceeds to say (859ff.) that, according to Anaxagoras, any given substance contains particles not only of its own kind but of other—indeed all other—kinds of matter. "All things are mixed in hiding in all things"; and by the things so mixed in others, he understands not the powers, but the various kinds of substance, blood in wheat, milk in grass, etc., that one substance being "manifest (*ap-parere*)" whereof the most [*sc.* particles] are mingled in it." Thus a given bit of flesh would consist of (i) flesh-particles, and (ii) particles of bone, hair, and every other substance, the flesh-particles quantitatively predominating over the rest. [48]

Now if we compare this account with the surviving fragments, we shall find it defective at a number of points. There is no mention of the concept of the "seed," nor of the [powers][opposites]. The one sentence which is almost a verbatim quotation can be shown to involve a serious discrepancy with the original. When Anaxagoras says that "each thing is most manifestly those things of which it has the most" {(B12 *sub fin.*)} the context [makes it perfectly clear][strongly suggests] that he is thinking of the variety of [powers][opposites]—rare, dense, etc.—not of the variety of seeds which it contains; ^{69a} it is the predominance of hot-rare-light-bright over their opposites which makes the difference between aether and air, not the predominance of aether-seeds over all the other seeds contained by aether. Lucretius assumes the latter, ignoring the former, and in this he is pretty typical of our secondary sources.⁷⁰ The question then is why the prominence of the [powers][opposites] in the fragments should be thus submerged in the account of Lucretius and others. We shall try to answer this question in due course. But let us now note that, when due allowance has been made for the deficiencies that have just been noted, Lucretius' residual rendering of Anaxagoras is perfectly sound. Turning to Anaxagoras immediately after his encounter with Empedocles, Lucretius fastens, quite properly, on two cardinal points at which Anaxagoras differs from Empedocles as much as from the atomists:

(i) Flesh, bone, hair, and a vast variety of other qualitatively dissimilar substances (not just four of them, as in Empedocles, or none of them, as in the atomists) are all "primordial" (1.847 *et sq.*), so that none of them could be generated from any of the rest, singly or in combination, but can only arise from particles of its own specific kind.

(ii) Each of these substances nevertheless contains every other kind of substance (contrary to both Empedocles and the atomists).

On the present reconstruction, both of these points appear as substantially correct statements of the unique challenge of the system to the atomists. (i) is

[Only opposites are mentioned.]

^{69a} So, e.g., Theophr. *apud Simpl. Phys.* 27 8ff.: "For that thing appears as gold in which there is much gold, though all (*sc.*, other substance) are present in it. See below, n 75.

the eternity and (ii) the commixture of the Anaxagorean seeds. Both can be grounded in the fragments: (i) in B10, (ii) in B4. The omission of the term *seed* may be explained, if not excused, [49] by its early importation into atomistic vocabulary which transposed it to an entirely different set of categories.⁷¹

But is this account of Anaxagoras' doctrine logically consistent? Cornford's study of Anaxagoras, one of the most thorough and thoughtful ever made, has pressed this question and answered it in the negative.⁷² Cornford saw "flat contradiction" in the two propositions which we find in Lucretius' as well as in Aristotle's, Theophrastus', and Simplicius' account of Anaxagoras: (i) There are homoeomerous substances; (ii) Each of them contains portions of all the rest. If (ii) were true, Cornford argues, (i) would have to be false. For (ii) would mean that a given substance like flesh would not be homoeomerous, any of its parts having exactly the same properties as every other, but extremely heteromerous, since it would have to contain a vast number of heterogeneous parts. Moreover, Cornford argues, (ii) is intrinsically unsound, for it leads to an endless regress. It assumes that a given substance, *x*, consists of a collection of dissimilar particles, *x*, *y*, *z*, etc., with the *x*-particles predominating over the rest. On this assumption we would never have any *xs* at all (or, for that matter, *ys*, or *zs*); for any *x*, however small, is in turn composed of the motley collection of *xs*, *ys*, *zs*, etc. Unless at some point we could get hold of genuine *xs*—particles which are *x* and nothing but *x*—we could never begin the process of composition in which *xs* could be mixed with *ys*, *zs*, etc. in the required proportion. Cornford's solution would be to throw out this whole conception as a misconception fathered by Aristotle on the tradition. "A portion of everything in everything," Cornford holds, must mean only (a) "a portion of every [power][opposite] in every seed," not (b), as Lucretius assumed, "a portion of every seed in every seed," nor (a) and (b), as Aristotle (*Phys.* 187a25–26) and others assumed, "a portion of every [power][opposite] and every seed in every seed." For only (a) would vindicate the principle of homoeomereia and break the vicious regress involved in (b). [50]

Of these two arguments, the second is inconclusive. Why should an infinite regress hold any terrors for Anaxagoras, who is committed to [the reality of the physical infinitesimal][the principle of infinite divisibility]?^{72a} The same

⁷¹ See above, Section I, n. 13. The principle of the seed in the atomists came with it the imputation that a certain thing can only arise from its own *specific* seeds, i.e., kind of atoms (cf. *Aris. Phys.* 195a31) in opposition to the Anaxagorean principle "anything can be generated from anything" (above, Section II, n. 66). Postulating that everything is a seed-aggregate of all things, Anaxagoras can hold that the two ideas listed as (i) and (ii) in the text above are complementary, while the atomists would appeal to the ordinary meaning of the seed (e.g., that wheat can grow only out of wheat-seeds) to argue that (i) and (ii) are incompatible.

⁷² See the opening paragraph of his paper (p. 14) *et passim*.

^{72a} [In view of subsequent criticism (Strang, pp. 101–2), I should emphasize the fact that the infinite regress which, I contend, would cause Anaxagoras no logical trouble, would be that

objection could have been urged against his principle that "of the small there is no smallest, but always a smaller." As Zeno would have argued, how could there be any magnitude at all on this assumption, since there is no "smallest" magnitude with which to begin the process of composition? It is the first, and only the first, of Cornford's arguments which points to a serious difficulty to which an answer must be found. But Cornford's answer cannot possibly be the right one. Quite apart from the violence it would do to a great mass of our ancient reports, it would founder on the fragments themselves. First of all, we have the statement in B4, already discussed in Section I, that "in all the things that are coming together there must be many things of all sorts and seeds of all things having all sorts of forms and colors and savors." The plain sense of this statement is that *any* creature of the creative process will contain "seeds of all things." On Cornford's view (pp. 28–29) this must be explained away to mean

generated by the principle stated in the middle of the preceding paragraph. A clearer statement of the principle might perhaps run as follows. Any portion of the matter of sensible size belonging to a given natural kind, *x*, consists of a collection of particles in which all the natural kinds, *x*, *y*, *z*, etc., are represented, but particles of kind *x* predominate in bulk. The same is true *mutatis mutandis* of particles, sub-particles, sub-sub-particles, . . . belonging to natural kind *x*. I maintain that the supposition that this would remain true at infinitely many levels of subdivision would not of itself lead to any logical difficulty whatsoever. The regress generated by this principle is no more logically noxious than is that generated by the principle of the infinite divisibility of matter. In defending Cornford against my criticism of him on this point, Strang apparently fails to note that my criticism is directed exclusively to Cornford's assumption that a regress by the above principle would be vicious, and that the regress which he (Strang) thinks is vicious is generated by an entirely different principle, which he formulates as follows: "The predominant ingredients in a substance are responsible for its most distinctive features." Does *this* principle generate a vicious regress? I have no doubt that it might, if suitably explicated and fortified with the requisite auxiliary premises. What I fail to see is that the quoted statement is a faithful transcript of the closing part of B12 ("each thing is and was most manifestly those things of which it has most in it"), which Strang supposes it to be. My own understanding of the text would be rather as follows: To belong to a given natural kind, *x*, a sensible thing does not need to consist exclusively of ingredients belonging to the same natural kind, it may—and, in fact, always does—contain ingredients belonging to innumerable other natural kinds, this does not prevent it from "manifest[ing] the properties characteristic of its own natural kind, provided only the ingredients belonging to its own kind greatly preponderate over those of its ingredients which belong to other natural kinds." I fail to see how this principle could generate any infinite regress whatever. In the first place, would the question of "manifest" properties (presumably, manifest to the senses) of the original datum recur with respect to its ingredients (presumably, of infra-sensible size)? Even if it did, and not only at this level—but at all of the infinitely many subsequent levels, there would still be no vicious regress, unless we were to suppose that Anaxagoras held that the properties "manifest" at the level of the original datum could not be identified or explained until the same thing had been done at each of the infinitely many subsequent levels—surely a gratuitous assumption. The fact that what happens at a given level *implies* that something happens at each of the infinitely many lower levels would of itself be logically harmless: there would be trouble if, and only if, in order to characterize, identify, explain, etc. what happens at a given level we must have completed the process of characterizing, identifying, explaining, etc. what happens at all of the lower levels.]

that "seeds of all things" are contained not in *each* emergent, but in all of them taken as a totality. But the statement that "there are many things in all things" recurs in B6; and there it is certain that "in all things" does not mean "in the whole totality of things" but "in each and every thing."⁷³ In the second place, we have the unambiguous and decisive implication of Anaxagoras' theory of nutrition for the point at issue. Flesh, milk, wheat are homoeomerous yet each of them must contain hair, bone, etc. If flesh will nourish hair, then flesh must contain hair *somehow*.⁷⁴ The only question is, How? [51]

We must agree with Cornford that Aristotle's answer to this question cannot be the right answer.⁷⁵ It is the idea that a given substance is composed of the juxtaposition of two *separate* sets of ingredients—the powers, on one hand, the seeds, on the other—both sets being necessary, neither being sufficient, to account for its distinctive and characteristic properties. This idea need only be spelled out to reveal its inherent redundancy. Flesh has any number of qualities: it is red, soft, heavy, etc. Given these powers in the required ratio, the result would *be* flesh. Why then need we mix flesh-seeds (or any other seeds) to these powers to produce flesh? The powers of flesh are *sufficient* to constitute flesh-seeds; flesh contains flesh-seeds not because these have been added to its powers as an additional set of necessary ingredients, but simply because in possessing the powers of flesh in the proper ratio, it is a set of flesh-seeds.⁷⁶

⁷³ As is clear from the sequel, "and of the [sc., powers which are] separating out [sc., there is] an equal multitude both in the greater and the lesser [sc., things]." Anaxagoras' expression for "the totality of things" is *to sumpān* (B4), *ta sumpantia* (B1), and this is what he would have used here, had he meant to say that seeds of all things were contained in the whole of creation rather than in each and every creature.

⁷⁴ It is astonishing that a mind as acute as Cornford's should have missed this very obvious implication. He ignored it by restricting his discussion of Anaxagoras' theory of nutrition to the case of bread (mentioned by Simplicius and Aetius): bread is made of wheat, which is a seed and therefore (on Cornford's view) not a homoeomerous substance (p. 20). That seeds are non-homoeomerous is an *ad hoc* hypothesis, without foundation in the evidence. Anyhow, this particular loophole would be wholly lacking in the case of flesh. If Anaxagoras believed in the existence of *any* homoeomerous substance, he must certainly have held flesh to be such; it is Aristotle's star example of Anaxagorean *homoiomerē*.

⁷⁵ [Peck seems the ablest of the modern exponents of this view, and my criticism is directed particularly to his defense of it (especially to pp. 32ff. of his 1931 paper). Aristotle's version is] [B]est expressed in his account of Anaxagoras in *Phys.* 187b4ff.: "Nothing is purely [*eihtkrinōs*] and entirely white or black or sweet or flesh or bone, but the nature of a thing appears to be that of which it contains the most." Thus a given thing will contain portions of both the powers (white, black, sweet, etc.) and homoeomerous substances (flesh, bone, etc.); cf. 187a25, "both the homoeomeres and the opposites [sc., the powers] are infinite in number." Lucretius' account disregards the powers as ingredients and merely mentions the particles of other homoeomerous substances in any given substance. So does Simplicius in the main, though he has hints of the other view as at *Phys.* 27.1 (following Theophrastus?), where it is said that the infinity of Anaxagorean *archai* are "composite, heterogeneous, and opposite" (*enantias*, which must refer to the powers, cf. *enantias* [sc. *tas archas*] in *Arist. Phys.* 184a22 and *l'anantia*, 187a25).

⁷⁶ For this interpretation of Anaxagoras, see Porphyry and Themistius *apud Simplicius Phys.*

The only reason for supposing the necessity of adding flesh-seeds to the powers of flesh to produce flesh would be the assumption that there is some simple quality, fleshiness, which flesh possesses in addition to all its [52] other specifiable powers. What reason could there be for such an assumption, so foreign to Ionian thought? Peck refers us to Aristotle's "explicit" testimony that Anaxagoras held flesh, bone, etc., to be "simple" substances (pp. 31ff.). Aristotle is explicit enough on this point; but his testimony here is worthless, for it is demonstrably contradictory and confused. For while he does tell us in *De gen. et cor.* 314a25ff. (and by implication in *De caelo* 308a28ff.) that Anaxagoras held flesh, bone, etc., to be "simple substances,"⁷⁷ he clearly implies at *Phys.* 187b24 that flesh is *not* simple, since water is "separated out of flesh" exactly as flesh is "separated out" of water. More generally, he tells us that flesh, bone, etc., are *seeds*;⁷⁸ but if seeds, they must be compounds: this, as I have argued in Section I, is of the essence of the contemporary concept of the seed and is specifically borne out by Anaxagoras' own account of the seed. But even if, for any reason whatever, one should discount this argument from the composite nature of the seed, flesh would still not be "simple," since on this view (Aristotle's and Peck's) flesh would contain the powers *and* flesh-seeds (as well as other kinds of seeds) and so would any

44 5ff.: "for they (the school of Anaxagoras) suppose that hotnesses and coldnesses, drynesses and wetnesses, rarenesses and densities, and the other qualitative contrasts are in the *homoiomerēai* which they regard as *archai*, and make the differences between the *homoiomerēai*." The translation is Cornford's (p. 92), who rightly calls attention to the importance of this passage. The closing sentence seems to me particularly significant as the only doxographic text which agrees unambiguously with the sense that Anaxagoras' phrase, "each thing is most manifestly those things [sc., powers] of which it contains the most," has in its own context in B12. The next best text in this respect is Gulen's statement of Anaxagoras' doctrine that the qualities are "eternally unalterable and unchangeable," apparent alterations being due to their "segregation and combination" (*De natur. facult.* 1.2.4; cited by Burnet, p. 263n.1), and Alexander's testimony (*apud Simplicius Phys.* 155.4ff.) that "the oppositions as well as all the [sc., qualitative] differences are in the *homoiomerēai*" (and Simplicius' own comment *ad loc.*).

And are "simpler" than earth, water, air, and fire, which he thought "composite.") An impressive number of modern commentators have taken at face value Aristotle's statements in these passages. Among these are W. D. Ross (*Aristotle's Metaphysics*, 2 vols., Oxford, 1924) (*ad Arist. Met.* 984 a14), and even Cornford, who does not scruple to reject the fundamentals of the Aristotelian interpretation of Anaxagoras. Yet I cannot believe that Aristotle can possibly be right on this particular point. What possible motive could have led Anaxagoras to discriminate against fire, air, water, and earth, which are the basic constituents of Ionian cosmology (including his own), denying them the title of Being which he assigned to every other substance? A departure of this magnitude could not have been overlooked by the doxographic tradition; but there is no trace of it after Aristotle. It is universally ignored and is contradicted by Lucretius, who takes fire, air, etc. to be *homoiomerē* on all fours with flesh, bone, etc., as well as by Simplicius (*Phys.* 27.5) and Philoponus (*De gen. et cor.* 13.26). As for the fragments, there is not a word to lend color to this Aristotelian view, while the mention of the earth among the seeds (above, Section I, n. 17) tells against it.

⁷⁸ *De caelo* 308a28ff.

of its parts *ad infinitum*. Thus any flesh-seed, however small, would be a compound, and no argument whatever may be premised on its supposed "simplicity."

There is a simpler answer to our question, and one which is wholly free from the redundancy of the traditional view. It explains how a bit of flesh does contain both (a) the infinite variety of powers and (b) the infinite variety of seeds, without assuming that (b) is a separate set of ingredients over and above (a). Any seed is made up [53] of the various powers in its own proper ratio; and since *all* the seeds are made up of the same set of powers, though in different ratios, it would follow that any seed contains any other, simply through the fact that it contains their necessary ingredients in portions which, however small, would still suffice to produce any of these other seeds in correspondingly minute form.⁷⁹ Thus any seed, *x*, contains any other seed, *y*, not because *y*-particles are to be found side by side with the *x*-particles in any portion of the substance *x*, but simply through the fact that any *x*-seed contains the powers which would produce *y*-seeds if sorted out of *x* in the ratio appropriate to *y*. Let the seed *x* be composed of the powers, *a*, *b*, *c*, *d*, etc., in the ratio of 10*a* for every *b*, *c*, *d*, etc.; and let the formula for a *y*-seed be 10*b* for every *a*, *c*, *d*, etc. Any *x*-seed would then contain a *y*-seed, since it is always possible to separate out of *x* appropriately smaller portions of *a*, *b*, *c*, *d*, etc., to make up a *y* in the required ratio. By the same token, an *x*-seed would also contain any other seed, *z*, since whatever may be the ratio of the powers in *z*, we would still be able to get a *z* out of *x*. Let the ratio of *b* to *a*, etc., in *z* be a million to one; we would still be able to say that every *x* contains a *z*, a *z*-seed being always (on this calculation) less than one millionth the size of the *x*-seed in which it is contained.⁸⁰ Conversely, any *z*-seed would always contain an

⁷⁹ This idea is implicit in the Tannery-Burnet interpretation. But I have not seen it explicitly made in the literature, except in F. M. Cleve's recent *Philosophy of Anaxagoras* (New York, 1949), pp. 87–88. I am directly indebted to Mr. Cleve at this important point. See my review of this book, *JPR*, 59 (1950b), 124–26.

⁸⁰ Since (i) all but the first two factors in the *z*-seed (i.e., *c*, *d*, etc.) would each be (by hypothesis) one millionth of the *b*-factor in *x*, and (ii) the *b*-factor in the *z*-seed would have to be smaller than the *b*-factor in the *x*-seed were it as large, the separation of the *z*-seed from the *x*-seed would leave the latter without any *b* factors at all, which would be contrary to the "portion of everything in everything" principle. Incidentally, we can now explain the sense in which air and aether "prevailed" in B1 (see above, Section I, n. 36): the constitution of the primitive mixture would be such that any portion of it could be separated without remainder into equal portions of air and aether, while to separate any two other substances out of it (say, flesh and bone) would leave a (relatively large) remainder. In other words, the constitution of the matrix was of the form 1 *a*, 1 not-*a*, 1 *b*, 1 not-*b*, 1 *c*, 1 not-*c*, etc., where *a*, *b*, *c*, etc., stand for the various qualities hot, dry, light, etc., and their respective opposites. (This on the general assumption of Presocratic cosmologies—Anaximander, Parmenides, Empedocles—that opposite powers are contained in equal ratio in the totality of existence; see my paper, cited above, at n. 25). If the formula for aether be, say, 9*a*, 1 not-*a*, 9 *b*, 1 not-*b*, 9 *c*, 1 not-*c*, etc., that for air would be 1 *a*, 9 not-*a*, 1 *b*, 9 not-*b*, 1 *c*, 9 not-*c*, etc. Thus air and aether between them *exhaust* the actual distribution of powers in the matrix.

1-[54]seed correspondingly smaller than itself. There is no difficulty in such a conception that would trouble one who believes that "of the small there is no smallest, but always a smaller."

This explanation meets the logical difficulty which Cornford rightly saw in the traditional view; it accounts for the containment of heterogeneous substances in one another (and therefore for the generation of heterogeneous substances from one another) without destroying the homogeneity of each. Thus flesh is homoeomerous through and through; proceeding by division we would find that all its parts, however small, are always flesh, containing the powers of flesh in exactly the same ratio as the whole; we would never find hair-particles, bone-particles, etc., in a bit of flesh side by side with flesh-particles, as Lucretius and other commentators assumed. Any part of flesh is flesh; you can never reduce flesh to not-flesh, as in Empedocles, by the mere process of division and subdivision. Yet any part of flesh does contain hair, bone, and the rest, since it contains the powers of each in sufficient quantities to generate each in their characteristic ratios. Thus hair can arise out of flesh, since the ingredients of flesh are also the ingredients of hair, and will constitute hair if taken in the required proportion. Yet hair never arises "out of not-hair"; it arises out of the ingredients of hair which are in flesh (as well as in every other substance) and need only be taken out of flesh in the proportion proper to hair.

The logical elegance of this proposal need not seduce us into taking it for anything more than what it is: a purely hypothetical reconstruction. On just such a scheme (and on no other yet proposed), Anaxagoras *could* have consistently held those two ideas which, on the evidence of both the fragments and the overwhelming mass of our ancient reports, he *did* hold: that (i) a homogeneous substance like flesh has being, so that it can only be generated from its own kind, yet (ii) every such substance contains seeds of all others, so that (in principle) any substance can be generated from any other. To say that this particular scheme was developed in parts of the text which have since been lost to us would be a mere guess, and an implausible one, since Aristotle, Simplicius, and the rest were not so stupid or so dishonest as to disregard a plain statement in the text which ran counter to their own interpretations. All that we can, or need, do is to show that if this were the implied structure of Anaxagoras' thought, [55] it is not hard to account for those misconceptions which Aristotle's clumsy exegesis foisted on the tradition.

It is the leveling of the privileged status of the four Empedoclean elements that struck Aristotle as the main innovation of Anaxagoras;⁸¹ and not without

⁸¹ See the contrast with Empedocles in *Met.* 984a8ff. cited above, Section I, n. 34. Similarly at *Phys.* 187a22ff. Much the same contrast at *De caelo* 302a28ff. and *De gen. et cor.* 314a25ff., but exaggerated to the point of saying that the Empedoclean "elements," so far from being the only "elements" in Anaxagoras, were not "elements" at all, but mere "composites," while those (and *only* those) substances which Empedocles had construed as composites became the "simples" of Anaxagoras' physics.

good reason, since this (as I have suggested in Section I) was the major polemical thesis of the first book of Anaxagoras' treatise. Here fire, air, water, earth were shown to be subject to mixture and transformation; and when Aristotle read (B4) that air, water, etc., arise through the successive transformation of a mixture that contained "an infinite variety of seeds" and that each of the successive products contained, like the original matrix, "seeds of all things," he concluded, quite rightly, that air, water, etc., are "composite substances" or "seed-aggregates." And he was equally right in observing that flesh, bone, hair, and all those other substances which Empedocles had degraded to purely derivative status are in this new system "elements," all equally primitive and underived, preexisting eternally as seeds in the primordial matrix. And since Aristotle took it as axiomatic that only "simple" substances can be "elements,"⁸² he concluded without further ado that flesh, hair, bone, and the other homoeomerous substances must also be "simple" for Anaxagoras and must differ in this respect from fire, air, water, earth, which are "composite."⁸³ The slipshod logic of this conclusion should mislead no one: it did not even convince Aristotle himself for, as we have seen, he knew perfectly well that in this system flesh was "composite" after all, his own flat assertions to the contrary notwithstanding. We have here just another instance of his constitutional incapacity to respect the logic of a set of categories which cut across his own. [56]

But once we allow for this particular blind spot and look to Aristotle not for exegesis of the system but for reports of what he read in the texts, we shall find that this residue is fully consistent with the reconstruction of the fragments that has been offered in this paper. In one important respect, his account is closer to the original than that of Theophrastus⁸⁴ or Lucretius. He conserves, as they do not, a mention of the powers as determinative of the specific nature of a given seed, though he immediately reveals his confusion by adding the seeds themselves as codeterminative of that nature.⁸⁵ The statement that "each thing is most manifestly those things of which it has the most," which, in its original context, plainly referred to a ratio of powers, is taken by Aristotle to refer to a ratio of powers and/or a ratio of seed-particles.

⁸² See, e.g., the formal definition of *stoicheion* at *Met.* 1014a26.

⁸³ This does not mean, of course, that Aristotle himself would concede the "simplicity" of the *homoiomerē* which he imputed to Anaxagoras. Clearly he could not, since in Aristotle's system flesh, bone, etc., are *not* simple and therefore not "elements." Anaxagoras is criticized on this ground at *De caelo* 302b14ff., immediately after he had been credited (or, as it now turns out, debited) with the view that "the *homoiomerē* are elements" (*ibid.*, 302a31 and b11).

⁸⁴ On the assumption that the first few lines of *Simpl. Phys.* 27 are a paraphrase of the section on Anaxagoras in Theophrastus' *Phys. Opin.* Simplicius had Theophrastus' text before him, since he quotes it repeatedly in this page (see Diels, *Dox. Graeci*, pp. 478–79), and it is unlikely that he deviates here in any important respect from Theophrastus' account.

⁸⁵ See above, n. 75

As we trace the fortunes of this statement in Theophrastus, Lucretius, and Simplicius, we can see the powers dropping out in favor of the homoeomerous seed-particles.⁸⁶ This must have been the prevailing interpretation, else it could not have been asserted so baldly by Lucretius; those who preserved the original doctrine must have been a small, uninfluential minority.⁸⁷ And it is not hard to explain the change. How much truth there is in the Aristotelian summary that the *homoiomerē* were the "elements" of Anaxagoras, we have already seen. Once this caption gained currency, Anaxagoras' doctrine could be confidently contrasted with that of his predecessors and contemporaries in the formula that his "elements" were not the air of Anaximenes or the fire of Heraclitus or the roots of Empedocles or the atoms of Leucippus, but the infinite variety of *homoiomereiai*. This was his innovation, and this would loom largest in the minds of most of his summarizers and critics, eclipsing the doctrine of the powers which he shared in traditional fashion with so many of his predecessors.

⁸⁶ *Loc. cit.*

See above, n. 76

ETHICS AND PHYSICS IN DEMOCRITUS

"DEMOCRITUS' 'ETHIC' hardly amounts to a moral theory," writes Cyril Bailey; "there is no effort to set the picture of the 'cheerful' man on a firm philosophical basis or to link it up in any way with the physical system."¹ Coming at the end of the most valuable study of Democritus that has yet appeared in English, this conclusion cannot be ignored. If one dissents, one must give reasons.² Yet mere polemics would be an unprofitable exercise. Bailey's conclusion issues from an interpretation of the fragments. It can best be met by an alternative, or rather, supplementary interpretation. I turn to it directly with one precaution to the reader: What follows does not attempt a discussion of Democritean ethics in its entirety. It leaves out the whole of the social ethic, including the most important concept of *aidōs*. It keeps deliberately to those aspects of Democritean ethics which can be linked, directly or indirectly, to the physics.

I. PSYCHE

I. Scientific medicine assumed that intelligence has a bodily basis,³ that mental disease has a bodily cause and is susceptible of bodily therapy.⁴ Democritus, himself the author of medical treatises,⁵ was no doubt willing to follow this methodology as far as it would go. Yet when he consciously gener-

From *PR* 54 (1945), 578-92, 55 (1946): 53-64; reprinted in Furley-Allen II, pp. 381-408. The editor has made minor changes in punctuation and spelling.

¹ *The Greek Atomists and Epicurus* (Oxford, 1928), 522.

² In this I have drawn heavily upon two recent studies: H. Langerbeck, *Doxis Epirusmū. Neue philologische Untersuchungen*, 10 (1935), and K. von Fritz, *Philosophie und sprachlicher Ausdruck bei Demokrit, Plato und Aristoteles*.

³ This assumption is so universal in the medical treatises that documentation is superfluous. For its earliest expression in our sources, see Heraclitus B117 and B118, Alcmaeon A5 (Theophr. *De sensu* 26) and A8 (Aëtius 4.17.1); and Parmenides B16. (N.B. All references to Presocratic fragments are to the fifth edition of DK; the numbering of doxographic material is prefaced by the letter A, and that of genuine fragments by the letter B.)

⁴ E.g., *On the Sacred Disease* explains all abnormal states as due to physical changes in the brain (ch. 17), whence it follows that "whoever knows how to cause in men by regimen moist or dry, hot or cold" (ch. 21) can cure mental disorder. So too *On Diet* 1.35 prescribes a bodily regimen to secure the proper balance (*krēsis*) of the physical ingredients of the soul and "speed up the revolutions" of the slow-witted.

⁵ B26b, c, d.

alized the concept of disease from "body" to "life" (*bios*) and "house,"⁶ he was [578] going one step further. He was asking for a new science (*sophiē*) that would do for the soul what medicine did for the body.⁷ Against the physician's professional bias to make the *logos* of the body the key to the well-being of both body and soul,⁸ Democritus insists: "It is fitting for men that they should make a *logos* more about the soul than about the body. For the perfection of the soul puts right the faults of the body. But strength of body without reasoning (*logismos*) improves the soul not one whit" (B187).

2. The first axiom of this *logos* of the soul is the ethical corollary of a proposition established in the physics, that the soul moves the body:⁹ soul, not body, is the responsible agent. This is not in any sense an assertion of dualism.¹⁰ For though the body is simply the soul's "instrument" or "tent,"¹¹ it is nonetheless absolutely essential to the integrity of the soul. Unlike Aristotle's active *nous*, "which is itself only when separated,"¹² or Plato's soul, for which the bodily partner is a moral nuisance,¹³ the Democritean soul-cluster would dissolve if deprived [579] of the body. And there is no hint in Democritus, as in Plato, that the soul is in danger of corruption or distraction through the body's needs and appetites. In so-called bodily excesses soul, not

⁶ B288.

⁷ B31. Diels thought this fragment spurious (he refers it to the "Letter to Hippocrates," DK, II, 227, line 11). But its component ideas occur also in B288 and B187. *Pathos* should, of course, not be read in the Aristotelian sense of "passion," but in the Hippocratic sense of "disease," as e.g., in *On Airs, Waters, etc.*, 22 ταῦτα τὰ πάθη θεία.

⁸ As one would expect, there are exceptions, when the medical men too think of a health-regimen for the soul in terms of the soul's own distinctive activities. There is more than a hint of this in *Visus* VI 5.5, "Exercise (*ponos*) is nourishment for the limbs and the flesh, sleep for the viscera. The soul's own exercise (*peripatos*) is reflection" (tr. following E. Littré, *Oeuvres complètes d'Hippocrate*, 10 vols. [Paris, 1839-61]) and Werner Jaeger, *Paideia*, III, 30).

⁹ To think of this proposition as Platonic is anachronistic. In Democritus it is an [elegant] [straightforward] deduction from the first principles of atomic physics: (i) soul-atoms are small and spherical (*De an.* 409a32, 406b20); therefore, (ii) they are most mobile (*De caelo* 306b-307a, "because they offer the fewest points of contact and are the least stable"); and (iii) the soul-cluster is more mobile than any other atomic cluster (*De an.* 404a6, "because such configurations are best adapted to penetrate everywhere and being themselves in motion, move other bodies"). Plato on the other hand adopts this idea only at the price of endless difficulties. For how can his own immaterial soul move the material body? Aristotle rightly rejects the soul-circles of the *Timaeus* as a logical answer to the *koinōnia* of the soul and body (*De an.* 406b26f.)

¹⁰ *Per contra*, Langerbeck (above, n. 2), p. 75.

¹¹ B 159, ὡςτερε ὀργάνου τινός ἢ σκεύους. Σκῆνος, *Skēnos*, Democritus' characteristic term for the body, occurs in none of the pre-Socratics, but is used in medical treatises, as, e.g., in the fragment *On Anatomy*, which also uses another word of Democritean flavor, *homorismnē skēnos* occurs also in *On the Heart* 7, where it is used as a synonym to avoid repetition of the word *sōma*.

¹² *De an.* 430a22.

¹³ The body is likened to the soul's chair (*Phaedo* 67d), shell (*Phaedr.* 250c), and tomb (*Gorg.* 493a). It is a pollution (*Rep.* 611b, c) and an evil (*Phaedo* 66d).

body, is to blame.¹⁴ Drunkenness and voluptuousness are foisted on the body by the soul, not the reverse.¹⁵ For that very reason Democritus would advise men, exactly as did Socrates, to care for their souls.¹⁶ There is a difference to be sure. "Socrates preaches and proselytizes."¹⁷ Democritus lets the physical and moral facts speak for themselves. Yet both appeal to the same earthly logic. "You don't get virtue from money, but money from virtue," says Socrates (*Ap.* 29b). "Men don't get happiness from bodies or money, but from right living and wide thoughts," says Democritus.¹⁸

3. So far everything follows in line with the basic physical conception. Does the connection snap when Democritus goes so far as to speak of the soul as "divine"?¹⁹ Platonic idealism makes sense of such language.²⁰ But it seems nonsense in the framework of atomic materialism. Then why does Democritus use it? Does he cut loose from his physical premises to say, "He who chooses the goods of the soul chooses the more divine, he who chooses those of the body chooses the more human"?²¹ The sense of this fragment parallels B57 and B105, where the spiritual/bodily [580] contrast is not rendered as divine/human (B37), but human/animal (*ktēnos*, B57; *zōiōdes*, B105). In all three fragments Democritus is saying that to a man his soul (*psuchē*, B37 = *nous*, B105 = *ēthos*, B57) is infinitely more important than his body. Then why not say so? Why use at all the term *divine*?

4. The answer is to be found in the well-established practice of Ionian rationalism to salvage religious terms so long as (a) they can be adapted to the exigencies of naturalistic logic; and (b) they do not inhibit rationalist criticism

¹⁴ B159 it is the soul's "carelessness, drunkenness, voluptuousness" that "destroyed (*kataphtheire*) and broke down (*diespase*)" the body

¹⁵ *Ibid.*; cf. also B223

¹⁶ The comparison has point in the light of Burnet's well-known claim that the concept of the soul as the ethical agent is a Socratic innovation ("The Socratic Doctrine of the Soul," in *Essays and Addresses* (London, 1929)). If, as Burnet says, the Athenians got a "shock" from Socrates' teaching "that there is something in us capable of attaining wisdom, and that this same thing is capable of attaining goodness" (140), then Democritus' public must have got the same shock, for that is exactly how he thought of the soul. Burnet's argument is vitiated by the assumption that the ghost-soul remained intact until challenged by Socrates. This does less than justice to the *physiologoi*, who were the first to fashion a natural concept of the soul. In that school advanced spirits like Socrates learned to think of the soul as a non-magical entity

¹⁷ Werner Jäger, *Paideia*, II, 41, q.v.

¹⁸ B40. "Wide thoughts" is Cyril Bailey's (above, n. 1) rendering of *poluphrosunē*. See also B170 and 171

¹⁹ B112, B37. Cf. also B18 and B21

²⁰ Because the soul is consubstantial with the souls of the immortal star-gods (*Tim.* 41d) and shares with them the "rational" (circular) motion so different from the six "wandering" (rectilinear) motions of terrestrial beings (*Tim.* 34a). After death the virtuous soul will share fully the life of the gods. See references given in Rohde, *Psyche* (Eng. tr. (W. B. Hillis, London, 1925)), Ch. 13, nn. 62, 63, 66, 70a

²¹ B37. Cf. also B189, where, of course, *thnētū* is only to be taken as the opposite to *theia*, taken literally it would be nonsense on Democritean assumptions

of magic. So, for example, the Hippocratean treatises: Call the "sacred" (or any other) disease "divine," if you will, but (a) understand its natural cause;²² and (b) do not let religious symbols deliver you into the hands of the "magicians, purifiers, charlatans, and quacks" who practice under religious auspices.²³ That is how Democritus appears to treat the term "divine." He does not mold his view of nature to satisfy religious longings. On the contrary, he takes religious terms like ambrosia and Hades and offers a rather disconcerting naturalistic explanation.²⁴ He is [581] content to say, "the gods give men all good things" (B175), so long as men remember that "sharp-eyed intelligence (*sc.* of men themselves) directs most things in life" (B119); so that if, for example, it is health men want, they will have to get it by intelligent self-control.²⁵

²² *On Sacr. Dis.* 14, "not god, but disease, is ravaging the body" Cf. with *ibid.* 21, "all divine and all human," or with *On Airs, Waters*, etc., 22, "these diseases are divine and so are all others and none of them is more divine than the rest." There is no contradiction: "Das Göttliche ist ihm der Naturvorgang selbst," W. Nestlé, *Hippocratea*, *Hermes* 73 (1938), p. 8.

²³ *On Sacr. Dis.* 2

²⁴ B25 and B1. The question of the gods in Democritus is a more complicated matter. Briefly,

(i) I consider the *eidola* as an aetiological explanation of the popular belief in the gods, and nothing more. Our best source for these *eidola*, B166 (Sextus), represents them clearly as natural objects; and they fall on animals as well as men, A79 (Clement). As "perishable" (*θνησθαργα μὲν, οὐκ ἀφθάρτα δέ*) they lack the defining property of the "immortal" gods. To be sure, they are, in Sextus' language "beneficial" or "harmful" (*τὰ μὲν εἶναι ἀγαθοποιὰ τὰ δὲ κακοποιὰ*). But this refers to their specific physical effect on the organism, as in the case of the *eidola* whose bad effect is described by Plutarch (A77): "They disturb and harm body and soul." This interpretation is confirmed by Hermippus (A78), while Cicero (A74) is inconclusive. Clement's phrase *ἀπὸ τῆς θείας οὐσίας* (A79) is his own interpretation—clearly a confusion with Epicurean doctrine (Note, above references are testimonia in DK)

(ii) Sext. ix. 24 and Lucr. V 1186–93 (under A75), in striking agreement with Critias' *Sisyphus*, lines 29–37, are still aetiology—citing ignorance and fear of celestial phenomena. The *eidola* are not essential for this explanation, and are not referred to, nor are they essential for

(iii) *Tritogeneia*, (B2), which shows an alternative, allegorical pattern of explaining traditional beliefs

(iv) B30 is probably neither a reference to the air of Diogenes of Apollonia (so Otto Kern, *Die Religion der Griechen* (Berlin, 1935) II, 291) nor irony (so Bailey [above n. 1], 175), but a fragment from a serious explanation of the origin of religion. Ed. Norden, *Agnostos Theos* (Leipzig, 1913), shows that in rhythm and style "panta Zeus" etc. is a prayer, and a very beautiful one (p. 164), he compares *λόγιοι ἄνδρες* in B30 with *πικνὸς καὶ σοφὸς τις γυνώμην ἄνθρωπος* in Critias' *Sisyphus* (p. 298)

(b) B129, *phren theia noutai*, so far from implying the existence of popular gods, is a rationalist declaration that "divine" things must submit to the same canons of analysis as any other. *Phren* and *noutai* suggest a conscious reference to critical reason as against "bastard" knowledge (See B125 for this use of *phren*, B64, B65 for *noesis*). Hence this fragment may well be a critique of the popular belief in the gods as a "bastard" inference from the sense impressions produced by the *eidola*

²⁵ Even in B175, taken entirely by itself the implication is clear that, had it not been for "blindness of mind and stupidity" men would have got for themselves those "good things"

5. In that spirit Democritus speaks of the soul as "divine." "The soul is the dwelling-place of the *daemon*" (B171) means in effect, "in the soul you will find the only *daemon* there is to find."²⁶ So we can now interpret B37 to imply, "devote to the soul that supreme concern you have been taught to give to things divine." But religious promises of immortality precluded by the laws of atoms and the void are sharply denounced (ψεύδεα περὶ τοῦ μετὰ τὴν τελευτὴν μυθοπλαστέοντες χρόνου).²⁷ Exalting the soul's moral (and in B18 and 21, poetic) dignity, the term *divine* does not cast so much as a shadow of otherworldliness across Democritus' naturalism. The contrast with Socrates and Plato remains unbridgeable.

II. "WELL-BEING"

1. "Cheerfulness," we are told in B191, comes through "moderation of enjoyment and harmony of life (*bios*)."²⁸ But this is immediately pushed further to a physical level of explanation: it is "great movements" or "movements over large intervals" in the soul which prevent it from being "cheerful" or "steadfast." Here "steadfast" builds a verbal bridge between the two senses of stability, physical and moral. Similar words are used by later interpretations of Democritean "cheerfulness": "unperturbedness" (*ataraxiē*), Stobaeus 2.7.3i (A167); "calm {and steadfast disposition}" (γαλήνῳς {καὶ εὐσταθῶς} ἡ ψυχὴ διαγχει), DL 9.45 (A1); "tranquillitas, securitas," Cicero, *De fin.* 5.8.23 (A169). But none of them has the force of the Democritean "undismay" [582] (*athumbiē*, B4, A169, B215; cf. also 75B3), where stability of soul appears not as a passive state but as a dynamic quality, able to withstand external shock without losing its inner balance.

2. For the technical Democritean term which denotes the physical ground of this resilient, undisturbable cheerfulness, we must look to "well-being" (*euestō*).²⁹ In literary usage this means broadly "prosperity."²⁹ But to an ato-

²⁶ As in Heraclitus' "Man's character is his *daemon*," B119.

²⁷ B297, an epoch-making statement. Immortality in any and every sense of the word "is here for the first time in the history of Greek thought, expressly denied," Rohde, *Psyche*, Eng. tr. (London, 1925), 386.

²⁸ Von Fritz's interpretation is suggestive (*Philosophie und sprachlicher Ausdruck*, 35): "Während das Wort *euthumiē* den Habitus des Glücklichen in seiner emotionalen und aktiven Bewegtheit bezeichnet, bezeichnet *euestō* seinen Zustand, gewissermassen seine Struktur; und während *euthumiē* den äusseren Habitus beschreibt, wie er unmittelbar in die Augen fällt, dringt die Bezeichnung *euestō* vielmehr analytisch in sein Inneres ein."

²⁹ The definition in Hesychius, εὐδαιμονία ἀπὸ τοῦ εὐ ἐστάναι τὸν οἶκον, apart from its wrong etymology (see ἐστῶ in LSJ), is unduly narrow. Generally *euestō* stands for the prosperity of the individual as much as for that of a community (for both uses see Aesch., Ag. 929 and 647). In any case, there can be no reasonable doubt that Democritus used *euestō* as coextensive with "cheerfulness" (see A14 5, A167; B2c, B4, B257). I fail to see why DK includes the definition in Hesychius among the Democritean fragments (B140).

mist *esto* (Doric for "being") can mean only one thing: atoms and the void.³⁰ And when we recall how self-conscious Democritus is in terminological matters, how boldly he bends language to the needs of his philosophy,³¹ it is quite unlikely that he would use *euestō* carelessly. He could adopt it as a general cognate of "cheerfulness" (B4) only if it meant the soul's "well-being" in an ontological, i.e., physical, sense.³² We can then understand why motions of wide amplitude are precluded: because they are prejudicial to the order and integrity of the atomic soul-cluster. This is never stated explicitly in the surviving fragments. But there are strong indirect indications that this is just what Democritus had in mind.

3. It is a common idea in the medical treatises that violent organic motion is injurious to health in general and mental health in particular. "A man is in the best possible condition when there is complete coction and rest" (*On Anc. Med.*, 19.54). The emphasis here falls on the technical term *coction* (*pepsis*), and its associated ideas of "balance" (*krēsis*) and "blending" [583] (*mixis*), 19.9. But the notion of "rest" is associated as a matter of course with proper "coction." The treatise *On the Sacred Disease* thinks of violent motion in the brain as the physical condition of mental derangement and concludes, "So long as the brain is quiet (*atremēsēi*), so long is man intelligent (*phronēi*)," 17.³³ *On Breaths*, 24, has a different aetiology for the "sacred disease," but the actual state of the disease is again described as a "disturbance" (in this case, of the blood): "The disease finally ends when . . . the blood has composed itself (*katastantos*) and calm has fallen over the body."

4. Surviving scraps of Democritean physiology offer some hints of his ideas on organic disturbance, its causes and effects. In a discussion of miscarriages (*Ael.*, *N.H.* 12.17; A152) Democritus traces the cause to the hot southerly winds which produce a threefold effect on the parent body:

- (i) expansive (δίστασθαι τὰ σώματα . . . δίστασθαι καὶ τὰς φλέβας καὶ τὰ ἄρθρα),³⁴
- (ii) relaxing (χαλνοῦσθαι),
- (iii) disorganizing (οὐχ ἡρμοσμένου πλανᾶσθαι).

Under the influence of the cold wind, on the contrary, the body becomes "hard to move"; is therefore strong (*errōtai*) and harmonious (*suntonon*); and is able

³⁰ In "Philolaus" B6, its sense is clearly ontological, ἃ μὲν ἐστὶ τῶν πραγμάτων αἰδιος οὐτις τις τοιούτος τῶν πραγμάτων ἐξ ὧν συνέστα ὁ κόσμος. So also Antiphon, the sophist, almost certainly under Democritean influence, uses another compound, *aerestō*, eternal being, in his book on *Alētheia* (87B22).

³¹ See, e.g., some of the terms coined by Democritus, B130 to B139a; cf. Section IV, 2 below. Exactly as *euthumiē* too has a physiological meaning, see below, n. 38.

³² Affective (*hedonai*, *euprosunai*, etc.) and emotional (*daimata*, *phoboi*, etc.) states are prominently associated with the brain-function discussed in this context.

³³ This *diastasis* of the flesh is bad business from the medical point of view. See *On Breaths* 11 and 12.

to perform its natural function.³⁵ Thus organic strength comes with a tight, stable condition of the bodily atoms; organic weakness comes with the reverse

5. There is more to the same effect in the theory of sensation and thought as reported by Theophrastus.³⁶ Thus the sweet flavor "disturbs" (*tarattei*) and "leads astray" (*planai*)³⁷ atoms with which it comes in contact; "moistened and moved out of their order" (*ἐκ τῆς τάξεως κινούμενα*), they flow into the belly" (par. 65). Here is an implied picture of clusters of atoms in the body each with their own order. If this order is disturbed, they can no longer keep their place in the body. The [584] soul-atoms too must preserve an analogous order, a "harmonious balance" (*συμμέτρως κατὰ τὴν κοῆσιν*); otherwise the soul cannot perform its normal function, thought (par. 58). A soul unbalanced by too much heat or too much cold would go out of its mind (*allophronein*).³⁸ Incidentally, Theophrastus' mention of the two extremes of temperature (and, consequently, of too much or too little motion)³⁹ should warn us against defining the physiological optimum in terms of absolute rest.⁴⁰ The opposite to the "great movements" of B191 would therefore be a dynamic equilibrium—which is exactly conveyed by *krēsis*.

6. This *krēsis*, however, is not merely a balance within the bodily microcosm.⁴¹ It is also a dynamic relation between microcosm and the surrounding portion of the macrocosm.⁴² This is well illustrated in Democritus' theory of respiration (Arist., *De anim.* 404a and *De resp.* 472a). The environment here is no static reservoir of soul-atoms, but an ominous, compressing force that would crush the soul out of our body if we did not have the power of respiration.⁴³ Thus the environment as such is neither "good" nor "bad," but both—a

³⁵ This is Aelian's account and we cannot press any of the words too far, though it is tempting to compare *dustasthai* with *ek megalōn dustēmātōn* in B191.

³⁶ *De sensu* 49–83

³⁷ Cf. *ouch hēmosmenou planasthai* above in Aelian, A152

³⁸ Cf. *Visus* 6.5 5, δὲ θυμὴ ἀνασπὰ καρδίην καὶ πλεῦμονα ἐξ ἐσωτᾶ, καὶ ἐξ κεφαλῆν τὰ θερμὰ καὶ τὸ ὑγρόν, ἢ δ' εὐθυμίᾳ ἀφίει καρδίην. Here *euthumiē* physiologically precludes the excessive warmth that deranges thought. Thus *euthumiē* and right thinking are physiologically connected

³⁹ Heat implies *diastasis* (above, II, 4) and, therefore, least obstruction to the motion of the soul-atoms

⁴⁰ Excluded, in any case, through the intrinsic mobility of the soul-atom

⁴¹ Democritus is apparently the first to use this expression (B34, τῷ ἐν τῷ ἀνθρώπῳ μικρῷ κόσμῳ).

⁴² [Arist., *Phys.* 246b4, "Thus bodily *aretai*, such as health or bodily well-being, we regard as consisting in a balance and harmony of hot and cold, in relation either to one another internally or to the environment (*pros to periechon*)."] Cf. *krasē kai summetriai* here with *summetrōs kata tēn krasin* quoted in the preceding paragraph. [Thus [too] is a recurrent theme in Hippocratic literature. See, e.g., *On Airs, Waters* etc., 12, for the effects of a temperate climate on *ta ēthea tōn anthrōpōn*. In *ibid.*, 5, even *sunesis* is affected by the prevailing winds

⁴³ 404a10–16

source of danger (as *ekthlibon*) and a source of relief (since it is the incoming soul-particles that check the crushing," 427a9). The decisive factor rests with the organism itself. We shall find this attitude again in Democritus' conception of "external" goods. "Through those very things whence we derive food, we also either get evil or else escape evil" (B172). This, of course, reinforces in yet another way the case of the soul which may thus wrest good from evil or, conversely, may find that even good things turn into their opposite if the soul is too clumsy to shape their course (B173). [585]

III. THE PLEASANT AND THE GOOD

1. That a *physiologos* should think of the good of the soul in terms of "well-being" = *krēsis* seems logical enough. But why think of it also in terms of *pleasure*? A glance at contemporary literature suggests one answer: Fifth century is still largely untouched by that ascetic distrust of pleasure which sweeps over the ancient world in later times.⁴⁴ In wholehearted, unashamed words, so pious a poet as Sophocles speaks of it as the thing without which life is not worth living: "With pleasures lost, a man, I think, no longer lives; I deem his life a living death."⁴⁵ Pleasure is so essentially the sense of life, that Aeschylus thinks of death as "the realm where joy is never known" (*Eum.* 301, 426; cf. *Soph. O.C.* 1218). So when Democritus defines the best life as "the most cheerful, least disturbed" (B189), he announces no novelty to his time. There is nonetheless a deep consistency with his physics in thus singling out the most vividly this-worldly aspect of the good life. For if the good be pleasure and, by common consent, there is no pleasure in the afterworld, then the physical annihilation of the afterlife does not diminish the goodness of human existence by so much as "the shadow of a smoke"

2. In scientific thought pleasure enjoys an equally high status. The medical association of pain with disease is so sweeping that "pain" and "illness" are commonly used as equivalent terms,⁴⁶ and pain is linked with the most general formulae of health and disease: "balance" and "symmetry" preclude pain; pain comes when the proper "mixture" is lost.⁴⁷ Philosophers take much the same attitude. Diogenes of Apollonia offers a perfectly general psychological theory of pleasure in terms of the proper (*kata phusin*) "mixture" of the air in

⁴⁴ I am not forgetting the ascetic strain in {the} Orphic {religion}{cults}. But see Rohde, *Psyche*, 302–3

⁴⁵ *Antigone* 1165–71. Athenaeus quotes these lines twice (7.280 and 12.547) and calls Sophocles τῆς ἡδονῆς πρὸ Ἑπικουροῦ ἐισηγητής—a curious way of reading history backward

⁴⁶ This is, of course, a commonsense matter that goes much further back than the medical treatises. Such terms as *algos* and *odunē* are frequently used to denote illness in Homer

⁴⁷ E.g., *On Anc. Med.* 14 and 18

the blood; and this same "mixture" is also the basis of "courage (*tharsos*), health, and their opposites."⁴⁸ [586]

3. Here then Democritus finds a hygienic view of pleasure ready to hand. He does not have to enunciate either the doctrine that pleasure is the normal concomitant of well-being and pain of the reverse; nor of the corollary that, therefore, the quest for pleasure should be assimilated to the discipline of the "measure." This latter was also implicit in the theory and practice of contemporary medicine. "To live for pleasure" is the medical term for the haphazard, unregulated life, the negation of medical regimen.⁴⁹ The doctor would have to advise—in the very words of Democritus (B74)—"accept no pleasure, unless it agrees with you." The word *sumpherein* used here is the key concept of Hippocratic regimen; it denotes what is in harmony with nature and is thus essential in preserving or restoring health.⁵⁰ It is interesting to see that not only *to sumpherein*, but nearly all the normative terms of Democritean ethics—*metron*, *metrion*, *harmonia*, *to deon*, *kairos*, *to kalon*, *to dikaion*—are also used by the medical writers to express the conduciveness of any process or act (whether of the body itself, or of its natural environment, or of the physician) to the state of health.⁵¹

⁴⁸ Theophr. *De sensu* 43 (*tharsos* here is suggestive; cf. Democritus' use of *tharsos gnômês* in B215). The medical significance of this analysis is confirmed by the fact that, as paraphrased in Theophrastus, it leads directly to the observation *κριτικώτατον δὲ ἡδονῆς τὴν γλῶτταν . . . διὸ σημειᾷ τε πλείοστα τοῖς κάμνονσι ἐπ' αὐτῆς εἶναι*. J. Beare thinks that "Theophrastus here misunderstood the word *hêdonê* used by Democritus (and also by Anaxagoras) in the traditional limited sense of "the pleasure of taste," or even of "taste" itself, as an objective thing—savor" (*Greek Theories of Elementary Cognition* (Oxford: Clarendon Press, 1906), 169n.3.) But why suppose that Diogenes himself made a sharp disjunction between "subjective" pleasure and "objective" savor? The discussion suggests that when he came to taste Diogenes was led by the ambivalence of savor-pleasure in *hêdonê* to analyze pleasure in perfectly general terms. The generality of the analysis is confirmed by the fact that it applies to both pleasure and pain. Notice how Theophrastus comes back to *lupê* in 45, *à propos* of the sense of pressure in the breast one feels when trying hard to remember—*δταν δὲ εὖρωσιν, διασκίδνασθαι* [sc. the unmixed air] *καὶ ἀνακουφίζεσθαι τῆς λύπης*.

⁴⁹ *On Anc. Med.* 5. Cf. also 10.7, *δι' ἡδονὴν ἢ δι' ἄλλην τινὰ συγκευρίην*, contrasted with *ἀ συμφέρει*.

⁵⁰ *Ibid.* 3.35, where *συμφέρουσα τροφή* = *ἀρμόζουσα τῇ φύσει*. The same sense of *ἀρμόζον* τῇ φύσει in a different context. *On Joints*, 62, *ὅπως ἂν συμφέρει τὰς ἀναλήψεις ποιεῖσθαι*. The converse (*ἀσύμφορα* = *τῇ ἀνθρ. φύσει πολέμια*) in *On Breaths*, 6. See Langerbeck's discussion of *to sumphoron*, *Doxis Epirusmiê*, 65–66.

⁵¹ *On Anc. Med.* 9, *δεῖ γὰρ μέτρου τινὸς στοχάσασθαι*. *On Sacr. Dis.* 8, *ἣν μὲν καλῶς καὶ μετρίως καθαρῇ καὶ μήτε πλέον μήτε ἔλασσον τοῦ δέοντος ἀπορροῇ, οὕτως ὑγιηροτάτην τὴν κεφαλὴν ἔχει*. *On Fractures* speaks of the "natural position" (*τὸ κατὰ φύσιν σχῆμα*, ch. 2) in which the fractured bone should be reset as *ἡ δικαιοτάτη φύσις*, ch. 1; and of *κατάτασιν δικαίην καὶ μὴ βιαίην*, ch. 30. Likewise *On Joints*, 7, speaks of *δικαιοτάτα μοχλεῦν* and *δικαιοτάτα ἀντιρρόπαι*. As for *hyperballein* (thrice in Democritus: B191, 233, 235), see the definition of the medical art in *On Breaths* 1, *ἀφαίρεσις ὑπερβαλλόντων, προσθεσις ἐλλειπόντων*.

4. However striking this parallelism may be, it should not [587] permit us to forget the distinctive purpose of Democritean *sophiê*: to heal the soul directly through reasoning (*logismos*). Democritus, therefore, must transform a medical analysis into a moral argument. He must (i) show what control the soul itself has over pleasure and pain; and (ii) persuade the soul to exert this control. (i) will be discussed in Section IV below. (ii) is a simpler matter, though it too has far-reaching theoretical implications. Many a doctor must have tried his hand at it to wear down a patient's resistance to a disagreeable regimen: "Give up this pleasure now," we can imagine him pleading, "and with your health back, you will more than make it up in pleasure." But strictly speaking such arguments are not the doctor's business.⁵² It is for the moralist to argue:

B233: If you step over the due measure (*metrion*), the most agreeable things will become most disagreeable

B236: . . . having overstepped the time-limit (*kairon*), their pleasures are brief and short-lived, . . . their pains many.

Therefore,

B211: Moderation (*sôphrosunê*) increases enjoyment and makes pleasure all the greater

5. What then can be the meaning of B188, "enjoyment and its opposite are the landmark (*horos*) of what does or does not agree with us (*sumphorôn kai asumphorôn*)" and of B4, "enjoyment is the landmark (*ouros*)"? The customary rendering "limit" for *ouros* is confusing. For Democritus has told us, "accept no pleasure unless it agrees with you" (B74).⁵³ How can he then say that pleasure is itself the "limit" of what does or does not agree with us? We can avoid the vicious circle by keeping to the literal sense of *ouros*, "landmark." In that famous simile in the *Iliad* (xii, 421), where two men dispute over the "landmarks" (*ouroi*), they hold a "measure" (*metron*) in their hands. The "landmark" is not itself the "measure," except derivatively; it is only the visible marking-point which reveals what only measurement [initially] decides. This is a good clue to what Democritus had in [588] mind: pleasure is the sign,⁵⁴ the appearance of "what agrees with us." The parallel in the theory of knowledge is "appearances are the sight of things unseen."⁵⁵ The objective atomic pattern which constitutes well-being is "unseen" in itself; pleasure is

⁵² In Plato, *Gorg.* 465b we see the specialist in persuasion taking over when the doctor gives up.

⁵³ See also B262 *κέρδει ὀρίζων ἡ ἡδονή, ἀδικεῖ*. (Cf. Thuc. 3.82.8, *ὃς μέχρι τοῦ δεῖναι καὶ τῇ πόλει συμφορὰν προτιθέντες, ἐς δὲ τὸ . . . δεῖ ἡδονὴν ἔχον ὀρίζοντες*.)

⁵⁴ In much the same sense as Plato uses *σημεῖον κατὰ τὴν αἴσθησιν* in *Theaet.* 192b, or as Aristotle speaks, still more broadly, of *ἐλευθερίας σημεῖον* in *Pol.* 1317b10.

⁵⁵ Anaxagoras, B21a. On this see further n. 61, below.

the "appearance" which shows it up. This "landmark" is not, of course, the unproved pleasure which stands *sub judice*, until proved hygienically sound; it is the proved pattern of pleasure, duly selected to accord with "well-being" and "cheerfulness."⁵⁶ Just as the boundary-stone makes visible the actual area within which a piece of property is located, so pleasure in this latter sense marks out the area of action which "agrees with" the well-being of the soul.

(6.) We can now make good sense of the crucial fragment B69, "The good and the true are the same for all men; the pleasant differs for different people" (*allōi allo*), and integrate Democritean ethics and epistemology:

(i) "The pleasant" in B69 corresponds to "sweet, bitter," etc. in B9 (and "sight, hearing," etc. in B11). In both cases we have "appearances," i.e., felt qualities which vary from one percipient to another,⁵⁷ because in each instance they depend on the percipient's bodily condition⁵⁸ and reflect its peculiarities. [589] (ii) "The good and the true" in B69 correspond to "being" (*ta eitei [onta]*) in B9, etc. "Being" is obviously the atoms and the void, and "the good" cheerfulness and well-being. Paired with "the true" in opposition to "the pleasant" in B69, "the good" can, therefore, only refer to atomic "being" itself. This confirms the present interpretation, which takes "well-being" to refer to the soul's atomic configuration (above, II, 2).

(iii) Now we know that "the good," superseding pleasure in the sense of (i), does not supersede pleasure altogether. On the contrary, the good is itself revealed in a pattern of pleasure. Similarly with sensation. Superseded in the sense of (i) by "genuine knowledge," it is not superseded absolutely. We are told as much in B125: for "mind" (*phrēn*) to "overthrow" the senses would be to overthrow itself (*πτῶμά τοι τὸ κατὰβλημα*). Unlike Platonic being

⁵⁶ An interesting medical parallel

(i) *On Use of Liquids* (Litré (above, n. 8), 6, 120): τὰ δ' ἄλλα βλάπτει καὶ ὠφελᾷ τὰ εἰρημένα [as evidenced in] ἡδονῇσι καὶ εὐφορίῃσι καὶ ἀχθηδόσι καὶ δυσφορίῃσιν . . .

(ii) *On Sacr. Dis.* 17, καὶ τούτῳ [sc. τῇ ἐγκεφάλῳ] φρονέομεν μάλιστα καὶ βλέπομεν καὶ διαγιγνώσκομεν τὰ τε αἰσχρὰ καὶ καλὰ καὶ κακὰ καὶ ἀγαθὰ καὶ ἡδέα καὶ ἀηδέα, τὰ μὲν νόμῳ διακρίνοντες, τὰ δὲ συμφέροντι αἰσθανόμενοι. (*Ta men* probably refers to *aischra, kaka*, and their opposites; *ta de* to *hēdea kai aēdea*. Or, alternatively, each of the three pairs of opposites are meant to be subdivided into one area of conventional discernment and another of perception through *sumpheron*. Either interpretation makes sense for our purposes.)

(i) conveys in somewhat restricted form the physiological equivalent to Democritus' psychological rule, pleasure, etc. are the manifestation of benefit or injury

(ii) inverts this situation. Instead of taking pleasure as the sign of the *sumpheron*, the *sumpheron* is taken as the basis of judgment (*diaginōskomen*) of what is pleasant and unpleasant. Here the pleasant is the cognoscendum, while in (i) it is the cognoscens—a neat parallel to pleasure *sub judice* and pleasure as landmark of *euesthō judicans* in Democritus

⁵⁷ Cf. *allōi allo* in B69 with A139 (Sextus), ἐκ τοῦ τὸ μέλι τοῖσδε μὲν πικρὸν τοῖσδε δὲ γλυκὴ φαίνεται and Theophr. *De sensu* 69, ἀπλῶς δὲ τὸ μὲν οὐχίμα καθ' αὐτὸ ἐστί, τὸ δὲ γλυκὴ καὶ ὅλως τὸ αἰσθητὸν πρὸς ἄλλο καὶ ἐν ἄλλοις, ὡς φησιν [Democritus]

⁵⁸ κατὰ τὴν τοῦ σώματος διαθήκην, B9 [and *epirusmiē hē doxis* in B7, if Langerbeck's interpretation (*Doxis Epirusmiē*) is accepted]

which, immaterial by definition, is never given in sensation, Democritean being is the material stuff of nature as we see, touch, and taste it.⁵⁹ The "assurance" (*pistis*)⁶⁰ of its existence must, therefore, be given in the phenomenon.⁶¹ This "sight of things unseen" is not the crude sensation of (i), but sensation enlightened by the "subtler" (*epi leptoteron*) [590] investigations⁶² of atomic theory.⁶³

7. "The good and the true are the same for all men" sounds like an explicit

⁵⁹ I cannot follow Cyril Bailey (above, n. 18), 184 in singling out touch as *the* sense which is "being." In B11 touch is put in the same boat with the other senses. The "appearances" of touch need interpretation through the "more subtle" inquiry just as much as those of the other senses

⁶⁰ *Pistis* in B125, *phrēn* gets its *pisteis* from the senses. This is confirmed by Sextus (*Adv. math.* 7.136, B9 in DK), who tells us that in his essay entitled *Kratuniēria*, Democritus "promised to assign to the senses the power of evidence (*to kratōs tēs pisteōs*)." This last should be compared with *pistis ischus* in Parmenides, B8, 12. *Pistis* in the pre-Socratics is not an inferior form of knowledge as in Plato, *Rep.* vi. 511e, but *evidence*, both in the subjective sense of confidence that one's belief is true and in the objective sense of reliable signs which justify such confidence

This is the general principle of scientific procedure among the historians and the medical men. What cannot be known (or seen) directly must be judged from what can. So Herodotus II 13, judging the unknown (*ta mē ginōskomena*) from the known (*tois emphanesi*), and *On Anc. Med.* 22, κατὰμινθάνειν δεῖ ταῦτα (sc. the internal organs which are not open to view) ἔξωθεν ἐκ τῶν φανεῶν. Anaxagoras generalizes this methodological rule into an epistemological proposition, ὅπως ἀδήλων τὰ φαινόμενα, B21a. Gorgias must have had this dictum in mind when he wrote (B11, sec. 13), μετειρολόγων λόγους, οἵτινες . . . τὰ ὑπὸστα καὶ ἀδηλα φαίνεσθαι τοῖς τῆς δόξης ὁμασιν ἐποίησαν. Note the association *apista kal adela* in joint opposition to *phainesthai*, thus the phenomenon brings with it *pistis* as well as *dēlōsis*—exactly as in Democritus' view of sensation (see preceding note). Gorgias' τοῖς τῆς δόξης ὁμασιν is, of course, devastatingly sceptical: the phenomena are "sight of things unseen," but only to a mind under the spell of the *metēorologōn logos*.

Cf. S. Luria's elegant interpretation of the epistemological basis of Democritus' defense of the tangent against Protagoras (*Quellen und Studien zur Geschichte der Mathematik* 2 (1933), 12). We cannot see a line touching a curve at one and only one point. But we can see that "je genauer unsere Zeichnung ist, desto kleiner die Strecke wird, auf welcher sich der Kreis mit der Tangent berührt." "Genuine knowledge" continues and completes this sensible series: ὅταν ἡ σκοπιή μηκέτι δύναται μῆτε ὁρᾶν ἐπ' ἑλαττον μῆτε ἀκούειν . . . μῆτε ἐν τῇ ψαύσει αὐθάνεσθαι, then "genuine knowledge" must proceed *epi leptoteron*. Thus, I suggest, the final "assurance" that there is such a thing as a tangent does not come from sight, unless you know *how* to look, i.e., how to interpret the sensible image in the light of the "more subtle" atomic theory and thus use "the appearance" as "sight of things unseen."

⁶¹ This account helps clear up the contradiction in the tradition which represents Democritus as saying, (A) the phenomenon has no truth (e.g., Sextus 8.6 and 7.369, A59 and A110 in DK), and (B) truth is in the phenomenon (e.g., Arist. 315b9 and 404a28). (A) must refer to the phenomenon as in (i), i.e., as "bastard knowledge", (B) to the phenomenon as in (iii), i.e., as "sight of things unseen." This position is a subtle one; it requires an imaginative effort to which Democritus' ancient interpreters proved unequal, notably Aristotle (cf. *Met.* 1009b11 with *De gen. et cor.* 315b9 or *De an.* 404a28). Theophrastus too found Democritus hopelessly self-contradictory (*De sensu* 69)

denial of Protagoras' "I call some things better than others, but none truer" (*Theaet.* 167b). The contrast epitomizes the difference between the last of the *physiologoi* and the first of the "sophists." Abandoning *physiologia*, Protagoras knocks down the physical scaffolding of truth. He can still find, he thinks, a basis for judgments of "better" and "worse" in the efficacy of "art."⁶⁴ But having lost a physical meaning for "being," he can only say that there is no truth except in appearance.⁶⁵ For the physical basis of objectivity, Protagoras substitutes a political one: the collective phenomenon becomes the only "measure" for the individual phenomenon.⁶⁶ Democritus, on the other hand, can take "man is the measure" in an entirely different sense. His physical concept of the soul defines a unitary human nature⁶⁷ which affords a basis for universally valid judgments [591].⁶⁸ In Protagoras, on the other hand, "man is the measure" means sensation without being, pleasure without well-being. Democritus should be remembered in the history of thought as the first to answer the Protagorean challenge. Paradoxical as it may seem, Sextus' association of the materialist, Democritus, with the idealist, Plato, in opposition to Protagorean phenomenalism is profoundly true.⁶⁹ [592]

IV. MAN MAKES HIMSELF

1. It may seem strange to us that Democritean cosmology should include a chapter on the origins of civilization.⁷⁰ It did not seem so to the Ionians. Thus Anaxagoras' fr. 4 assumes as a matter of course that civilization is a cosmic episode: the works of man (*poleis, erga, oikēseis*) are implicit (*eneinai*) in the

⁶⁴ As presented in *Theaet.* 166d f., this position is ingenious and sophisticated; whether it is tenable is another matter.

⁶⁵ *Theaet.* 166d, τῷ μὲν ἄλλα ἔστι τε καὶ φαίνεται, τοῖ δὲ ἄλλα. Cf. DK 80A14 and 15 (Sextus); 80A19 (Arist. 1062b19), and 80A16 (Hermias).

⁶⁶ *Theaet.* 167c; and cf. 172b where the disconnection with *physis* is made explicit by Plato. It has been noticed that *dokēi, doxan* allude to *edoxen* used in official decrees (J. Stenzel, in his article on Antiphon, *RE*, Suppl. 4, 38b). [Adolfo Levi ("Studies on Protagoras") *Philosophy* 15 (1940), 147–67, here 165f.] suggests that Protagoras cut ethics loose from physics precisely to forestall the dangerous social doctrines derivable from *physis*, as, e.g., by Calicles in the *Gorgias*.]

⁶⁷ Can this be the sense of that baffling fragment, B124: "One (man) is (many) men and all (men) are man"? DK gives it up as unintelligible.

⁶⁸ This is how medical thought faced the problem of the *allo allōi*. Cf. *On Anc. Med.* 20: Cheese agrees with some people, but not with others. The physician must therefore understand "human nature" and its "causes" so that he may discover rules which are valid for all men. It is interesting to see how empirically the search for this universal proceeds, investigating relations and consequences: ὅ τί τε ἐστὶν ἄνθρωπος πρὸς τὰ ἐσθιόμενα . . . καὶ ὅτι πρὸς τὰ ἄλλα ἐπιτηδεύματα, καὶ ὅτι ἄφ' ἐκάστου ἐκάστῳ συμβήσεται.

⁶⁹ *Adv. math.* 7.389 (DK 80A15).

⁷⁰ See the material collected by DK under B5, and my paper, "On the Pre-History in Diodorus," *AJP* 67 (1946), 51–59 (**1 351ff.)

original "mixture"; they are the physical consequence of the cosmogonic "separation."⁷¹ Yet it is one thing to conceive of man and his arts as the creation of nature; it is quite another to purge one's own mind completely of the traditional, anthropocentric worldview. Anaxagoras gives himself away in this fragment with the assumption that each "separation" is bound to produce men, and that "these will have a sun and a moon and the rest as with us."⁷² Democritus' doctrine that "some worlds are without any sun or moon . . . and some are without any living creatures" (Hipp. Ref. i.13.3; A40) looks like a conscious repudiation of the teleological streak in [53] Anaxagorean physics. Schooled to "refer to necessity all things which nature employs" (Arist., *De gen. an.* 789b4), Democritus could assimilate the origins of human culture to the same methodology. The result was a profound imaginative innovation. *Anankē*, which figured in Aeschylus not only as alien to *technē*, but as its obdurate, invincible opponent,⁷³ now displaces Prometheus himself as the progenitor of *technē*. {In} Democritus' phrase, "necessity {*t'anankaion*} separated them out (*sc.*, the arts)" (B144), [follows Anaxagoras in thinking of the event in terms of the cosmogonic "separation." But adding "necessity" (*t'anankaion*), he carries the logic of the Ionian position to its ultimate necessitarian conclusion.]

2. Just how did Democritus think of necessity "separating out" the arts? For the general outlines of his answer, we can only look to the Hecataean fragment in Diodorus 1.8. There "need" or "necessity" are man's "teachers."⁷⁴ Struggling to survive against hostile forces in his environment,⁷⁵ man is compelled to associate himself with other men; hence speech (1.8.3, 4). He is also compelled to learn from experience (*peira*, 1.8.7); hence the mechanical arts.⁷⁶ These "discoveries" (*heurēmata*) change not only external arrange-

The conflict of *physis* and *nomos* is not a symptom of the dissociation of man from nature, but the reverse. Archelaus, whose cosmology also carried over into prehistory (A4), taught that our ideas of what is just and base are not *phusei* but *nomōi* (A1 and A2).

⁷¹ Uxkull-Gyllenband's valuable study *Griechische Kultur-Entstehungslehren* (Berlin, 1924), 10f. outstrips the evidence on this point, making Anaxagoras the philosophical source of the anthropocentric theory of culture in the fifth century. Between Anaxagoras and the simple piety of Xenophon's *Mem.* iv. 3, a great gulf is fixed. Socrates' yearnings for a teleological universe found slim comfort in Anaxagoras. It seems more consistent with the evidence to acknowledge the conflict between teleology and mechanism in Anaxagoras' thought, with mechanism dominating the actual working out of the system.

⁷² P.V. 514, τέχνη δ' ἀνάγκης ἀσθενεστέρα μακροῦ

⁷³ Diod. 1.8.7, καθόλου γὰρ πάντων τὴν χρεῖαν αὐτὴν διδάσκαλον γενέσθαι τοῖς ἀνθρώποις. As for τὴν ἀνάγκην σθένος διδάσκαλον, it occurs in the Tzetzes excerpt (DK, II, 13b, line 1) which is even less reliable as a source than Diodorus, however, the term *anankē*, matching *t'anankaion* in B144, may safely be accepted as genuine. Cf. *On Anc. Med.*, ch. 3, where *anankē* and *chreia* are used interchangeably as mainsprings of progress in the medical arts.

⁷⁴ Beasts of prey the year round, cold and food-shortage in the winter (1.8.2 and 6).

⁷⁵ Aelian *N.H.* 12.6 (A151), in his account of the discovery of the mule, gives an illustration of what Democritus meant by "learning from experience".

ments, but his very life (*bios*).⁷⁷ And since we know that [54] Democritus thinks of "life" as dependent upon the form of the soul (B61), the change goes further still: it is tantamount to a transformation of the soul. The nature of the soul is not fixed by the original pattern of the soul-atoms. This pattern itself can be changed: "Teaching (*didaxē*) re-forms (*metarusmoi*) a man, and by re-forming, makes his nature (*phusiopoiei*)" (B33, Bailey's tr.). Both verbs in this sentence deserve close attention:

(a) *Metarusmoi* (matched by the equivalent term *ameipsirusmein*)⁷⁸ must refer to a change in the ultimate physical *rusmos* ("configuration") of the soul-atoms.⁷⁹

(b) *Phusiopoiei*, unique in Greek literature, suggests the force with which Democritus grasped the idea of "human nature in the making."

3. To be sure, the concept of nature as itself the product of teaching and custom is not unique in Democritus. It is the common property of the age. For

(a) something happens "by chance" (i.e., by necessary forces beyond human control);

(b) men observe how it happened,

(c) they can then convert "chance" into "custom" (*sunētheia*). This must be the general pattern according to which men are "taught" by nature (cf. *mathēias* here with B154. See also below, n. 85). But to complete the pattern we should add

(d) man's own "need" which sensitizes him to the value of a useful sequence when he runs into it. (Cf. the account of the origin of fire in Diod. I.13.3 with Lucr. V, 1091f. Lucretius simply describes the natural means by which the fire was produced. Diodorus, whose Hecataean source may reflect Democritean ideas, dwells on the connection of the event with human need and on the human means by which the physical event was appropriated.)

⁷⁷ Precivilized life was less than human ("disorderly," "beastly," "solitary" Diod. I.8.1.)

⁷⁸ *Ameipsirusmiē* is defined in Hesychius' dictionary as ἀλλάσσειν τὴν σύγκρισιν ἢ μεταμορφοῦσθαι (B139), and it is matched in turn by *ameipsikosmiē* (B138). That this concerns an important part of Democritean thought is clear from the title of two treatises, *Peri Ameipsirusmion* (B8a) and *Peri Diapherontōn Rusmōn* (B51), both classed by Thrasyllus under *Phusika*.

⁷⁹ *Diathigē* and *tropos* which, with *rusmos*, explain all qualitative differences in atomic physics (Arist., *Met.* 985b15f.), turn up in various compounds in ethical fragments.

(a) *Eutropiē* in B57, where *hē tou ētheos eutropiē* is used as the broadest possible description of human virtue to balance "bodily strength" in animals. Again, *tropos eutaktos* is used of the inner order of the soul which determines the order of man's outward life (B61).

(b) *Kakothigē*, Diels' conjectural reading in B223, if correct, would be the ethical counterpart of (bad) atomic *diathigē*, which I interpret following Beare (above, n. 48), 37n.2, "Probably *diathigē* is dialectic = *diathēkē*, i.e., *diathesis* and not = 'contact' (< -thig-)." (Mr. C.C.W. Taylor contends that Democritus could not have used *metarusmoō* to refer to a change of arrangements of atoms, because [1] *rusmos* "was used as an atomistic technical term, meaning the shape of the individual atoms, while [2] the word for their arrangement was *diathigē*" ("Pleasure, Knowledge and Sensation in Democritus," *Phronesis* 12 [1967], 6-27, at 14-15—a paper which contains some acute criticism of my views). I would reply to [2] that all we know is that *diathigē* was a term for this purpose; so too in the case of [1]: our data by no means preclude (the) use of *rusmos* in other senses (cf. senses III and IV in LSJ, "proportion, arrangement, order"; "state or condition"), while the definition of *ameipsirusmiē* in Hesychius (cited in the preceding note), taken in conjunction with *Peri Ameipsirusmion* as the title of one of Democritus' physical writings, is positive evidence for the claim which Taylor disputes.)

the sophist it provides an *apologia pro arte sua*. For the medical man it expresses a norm of "nature" which takes into account not merely anatomical structure but also the patient's established habits and mode of life.⁸⁰ Yet philosophical originality lies not so much in novelty, as in powerful generalization and fruitful interrelation of ideas. This Democritus did with his [55] concept of "teaching that makes nature," turning it into a nest of interconnections between physics and ethics:

(i) "Teaching" frees man not from necessity (which is absolutely impossible) but from chance (which is largely possible);

(ii) "Teaching" can be directed not only outward, upon external nature, but also inward, to attack the salient which chance holds within man's own nature—sensation and pleasure;

(iii) The combined effect of (i) and (ii) is the use of man's own proper power to increase that power and thus advance his self-sufficiency.

4. So much talk of chance in the ethical fragments seems "odd" to Cyril Bailey ((above, n. 18), 188): "there is here a striking contrast to the suppression of the idea of chance in the physical theory and it seems to show that Democritus' ethics are largely independent of his physics." But chance is not only consistent with physics (Bailey says, "not necessarily inconsistent," 187); it can only be correctly explained through the physics. It enjoys the same kind of status as, e.g., color.⁸¹ Neither exists absolutely in the atoms themselves. Both exist in relation to our own sentience or action—and this not in spite of atomic law, but because of it. As the author of *On Nutriment* speaks of "spontaneous" organic processes, "spontaneous with regard to us, but not spontaneous with regard to the cause,"⁸² so Democritus speaks of "chance" events. Ignoring this distinction, "bastard knowledge" attributes color and chance absolutely to being. In the case of chance, this is more than error; it is "rationalization." The fiction of chance excuses, and therefore confirms, our own stupidity and helplessness (*prophasis idiēs aboulēs*, B119). Thus the misunderstanding of the relative reality of chance means an absolute reduction in our own natural power. Hence Democritus' preoccupation with chance in the ethics. It is no mere matter of linguistics to be settled in a semantic foot-

Didachē phusiopoios is closely paralleled by *mathēsis emphusiōtheisa* in the Hippocratican *Nomos* 2. (Cf. *On Airs, Waters, etc.*, 14, explaining longheadedness as a result of shaping artificially the head: the work of *nomos* becomes *phusis* with the passage of time. Even more striking is the use of such terms as the following in diagnosis: *to sunēthes*, *Prognostic* 3.19 and 3.25, *to ethos*, *On Ac. Med.* 10; *to memathēkas*, *ibid.* and also in *On Diet in Acute Illness* 28.)

Arist. *De gen. et cor.* 316a1, "he denies the being of color; things get colored by configuration (*tropē*)."

⁸² Ch. 14. Cf. also *On Anc. Med.* 9, καθαιρόμενοι, ἢ αὐτόματοι ἢ ἀπὸ φαρμάκων. In general "chance" in Hippocratican literature refers to anything in default of art, especially medical art, thus, *On Anc. Med.* 1, τύχη δ' ἂν πάντα τῶν καμνόντων διοικεῖτο (i.e., before the discovery of medicine) and *ibid.* 12, ὡς καλῶς καὶ ὀρθῶς ἐξέρχονται καὶ οὐκ ἀπὸ τύχης.

note. [56] It is a moral encounter with the competitor and opponent of "teaching" that has power to change human nature after its own pattern: "The stupid are formed (*rusmountai*)⁸³ by the gains of chance; but those who understand these things (are formed) by (the gains of) wisdom" (B197).

5. We can now integrate this notion of chance with that distinction between crude and enlightened sensation, between questionable and sound pleasure, which is at the heart of Democritean epistemology and ethics (III, 7). This change in our *rusmos* for whose control "teaching" contends with "chance" occurs to a lesser, but equally definite, extent with the impact of every incoming stimulus upon our senses. Every perception is such an impact (B9); and when knowledge is nothing more than the cumulative sequence of such external impacts—and in that sense the child of chance—then it is "bastard knowledge." Only when fathered upon our senses by the soul's inherent power to move itself in the "subtler" inquiry of reason, is it "genuine knowledge." This interpretation, of course, is pure reconstruction. There is no evidence in the sources that Democritus so applied the notion of chance to his theory of knowledge, though it is so applicable. But we know that he applied it in ethics through the cognate notion of teaching, "hard work" (*ponos*):⁸⁴ "Learning (*mathēsis*)⁸⁵ achieves good things through hard work; but bad things grow spontaneously without hard work" (B182). So too B178 tells us why "indulgence" (*eupeteiē*, the negation of hard work) is the "worst possible thing": for this is what gives birth to "those pleasures, from which badness comes into being."

6. Here is a more powerful idea than the notion of "overcoming" [57] pleasure.⁸⁶ It is particularly important for Democritus' hygienic conception of pleasure. For it clearly thinks of pleasure as the creature, not the creator, of the good life. "Badness" does not come from pleasure as such (any more than drunkenness, etc. come from the body, cf. above I, 4). The pleasures from

⁸³ The verb *rusmōō* here is apparently the only instance of its kind, apart from one other in the late writer, Symmachus. As in *meiarusmein*, Democritus must be thinking of the basic *rusmos* of the soul-atoms.

⁸⁴ Two things are worth noting about *ponos* in Democritus.

(i) It is the process by which art itself is appropriated: B59, *technē* and *sophiē* are achieved only through *mathēsis*. B182, . . . τοῖς πόνοις ἡ μάθησις ἐξεργάζεται; and B157, τὴν πολιτικὴν τέχνην ἐκδιδάσκεισθαι καὶ τοὺς πόνους διώκειν.

(ii) It covers the whole area, physical and spiritual, which science wrests from chance. See B179, which brings explicitly under *ponon* athletic excellence, letters, music, and, most important of all, "reverence" (*aidōs*). B157 brings in also political skill under *ponoi*.

⁸⁵ Cf. *mathēsis* in A151, B254, and B59, also in Diod. 1.8.7.

⁸⁶ B214, ὁ τῶν ἡδονῶν κρείσσων vs. those who γυναιξὶ δουλεύουσιν. The same idea in Gorg. B11a (15), οἱ κρείττονες τῶν τῆς φύσεως ἡδονῶν vs. οἱ δουλεύοντες ταῖς ἡδοναῖς, and in Antiphon the sophist, who presents most sharply the underlying idea of self-mastery: αὐτὸς ἐωυτὸν κρατεῖν (B58) and κρατεῖσθαι αὐτὸς ἐωυτὸν κόσμιον παρέχεται (B59).

which it comes are not given in human nature as such; they are formed in human nature through the soul's failure to make for itself a nobler pattern of pleasure:

B189: "It is best for man to lead his life with the maximum of pleasure and the minimum of grief. This would come about if he would not *make his pleasure* in mortal things" (μὴ ἐπὶ τοῖς θνητοῖσι τὰς ἡδονὰς ποιοῖτο).

B235: "Those who *take their pleasures* from the belly (ἀπὸ γαστρὸς τὰς ἡδονὰς ποιεῖνται) . . ."

The locus of pleasure is thus not decided for us by our "given" constitution. There is the body, to be sure, with its relatively fixed loci of pleasure. But the soul retains the power to integrate these as subordinate parts of a larger pattern of pleasure which is decisive for its happiness. Failing to use this power, it will have to fall back on the pleasures of the belly, will demand more of these pleasures than they can give within the law of the limit, will therefore overstep the limit and pay for it in pain.

7. But would not the life of "hard work"—with its double association of exercise and painful exertion⁸⁷—be the negation of pleasure and thus the wedge that pries "well-being" loose from "cheerfulness"? There are four considerations in Democritus to meet this:

(i) In the absence of hard work, pleasures (as we have seen) would "grow wild," and the short-lived ones that are followed by pain would luxuriate (So B235; cf. also B242).

(ii) "Continuous hard work grows ever lighter through habituation" (B241).

(iii) Achievement makes hard work more pleasant than even [58] rest would be. Only when unsuccessful is hard work "annoying and miserable" (B242).

(iv) In any case, the life of hard work guarantees, as haphazard living never can, the essential condition of "cheerfulness" and "well-being": self-sufficiency (*autarkeia*). "Chance is a giver of great gifts, but uncertain. Nature is self-sufficient" (B176). "Chance spreads before us a lavish banquet, but moderation a self-sufficient one" (B210).

8. In this first encounter with the concept of self-sufficiency, we should note its ambivalence: It may mean the deflation of desire and curtailment of enterprise to forestall any collision with the impossible; or else it may mean the resourceful extension of skill, enlargement of purpose, enhancement of power through the better understanding of the possible. The two moods are not incompatible. They can blend under the dominance of the second to produce a confident, adventurous, experimental attitude toward life. But if the balance

⁸⁷ So in Hippocr. lit. See Littré's Index under "Exercice" and "Peine". Its most common meaning elsewhere is most nearly rendered in English by "hard work" (e.g., Xenophanes B25, Antiphon B49, Epicharmus B36).

tilts in favor of the first, self-sufficiency becomes the maxim of an introverted quest for security, seeking peace of mind through the inhibition rather than the extension of action. So we may see it in Democritus' own social ethic.⁸⁸ But this is not the form in which it appears in the present context. "Nature is self-sufficient" here has much the same sense as the medical rule that the state of "balance" is "most self-sufficient":⁸⁹ self-sufficiency is the power of self-maintenance given to the healthy creature in its very nature. Nature is this power of self-maintenance;⁹⁰ hence the expression "one's own power and nature," as we find it both in Democritus and in the medical literature.⁹¹ As such, nature defines [59] an order of what is "possible" and "impossible."⁹² But man's nature is not fixed; as Heraclitus thought of man, he is a "self-increasing *logos*" (B115). Through "teaching" he can make his own nature and has been making it every since he was first taught by necessity to turn necessity, through "art," into the ally of his power. There is nothing in the concept of self-sufficiency as such to negate this dynamic view of human nature. There is simply the reminder that this development can proceed only within the limits of the "possible." Nature is self-sufficient because it never oversteps those limits. Neither must "teaching," if it is to be the "teaching that makes nature." Contrariwise, attempting the impossible, it would prove the undoing of art, and thus submission to chance.

V. THEORY AND PRACTICE

1. The contrast of "deed" (*ergon*) and *logos*, so familiar, even commonplace, in fifth-century literature, can now find its proper place in Democritus' system.⁹³ *Logos* is morally important only insofar as it is "teaching that makes

⁸⁸ In general, wherever self-sufficiency appears in the context of social relations, the mood "be content with what you have, don't ask for more" predominates in Democritus. So, for example, in B191. Langerbeck's interpretation is too one-sided to admit this (*Deus Epitrusmiē* 59). It is true that *arkeesthai* may mean "Nicht bedürfen," not "Sich begnügen." But what else than "Sich begnügen" is there in "comparing your own life with that of those who are worse off and congratulating yourself at the thought of their misfortunes" (B191)? This fragment drifts into this mood precisely when it passes from the physical basis of "cheerfulness" to the social context.

⁸⁹ On Diet, 1, 35, *krēsis autarkestaton*. Cf. Thuc. 2.5.1.3, no one's physique proved self-sufficient (*autarkes*), i.e., strong enough to resist the disease.

⁹⁰ For a quaint instance of nature as *autarkēs* because of its power of self-help, see Aeschylus *Choe*. 757, *véa δὲ νηδὺς αὐτάρχης τέχνων*.

⁹¹ Cf. τὴν δύναμιν ἑωυτοῦ καὶ τὴν φύσιν in B3, with τὴν τοῦ ἀνθρώπου φύσιν τε καὶ δύναμιν in *On Anc. Med.*, 3; ἑκαστον ἔχει (sc. the four humors) δύναμιν τε καὶ φύσιν τὴν ἑωυτοῦ in *On Nature of Man* 5; and φύσιν δὲ ἑκαστον (sc. νόσσημα) ἔχει καὶ δύναμιν ἐφ' ἑωυτοῦ in *On Sacr. Dis* 21.

⁹² *Dunata*, B191, *ephkta*, B58 and 59, *adunata*, B58.

⁹³ Prior to the fifth century, not the contrast but the unity of thought and deed is uppermost. In

nature" and thus affects action.⁹⁴ This is no platitude if we think of it against the sophist's glib claims for the power of his *logos* to produce right action.⁹⁵ Democritus counters with, "many who have never learned *logos* live in accordance with *logos*" (B53), while "many practice the noblest *logoi* while doing the basest deeds" (B53a). The tone of the argument grows sharper with B82, "those who do everything in *logos*, nothing in action, are fakes; they have only the semblance of truth" {κίβδηλοι καὶ ἀγαθοφανέες οἱ λόγῳ μὲν ἅπαντα, ἔργῳ δὲ οὐδὲν ἔρδοντες}, and B145, "*logos* is but the shadow of the deed." [Such sayings, incidentally, also distinguish Democritus from his paradoxical allies in the battle against Protagoras. Socrates [60] and Plato would level the charge of *alēthophaneia* directly against the *logos* of the sophist. It is characteristic of Democritus that he should find in the deed the touchstone of sophistic unreality.]

2. But neither does Democritus underrate the distinctively psychic function of intention and wish.

B68: "The trustworthy and untrustworthy man (*dokimos, adokimos*) is to be known not only from what he does, but also from what he wants."

B62: "It is not the absence of injustice that is good, but the absence of the desire (to commit injustice)."

B89: "Not he who wrongs you, but he who wants to wrong you, is the enemy."

One should not interpret such sayings as a retreat in the direction of subjectivism. Why should a man of action underestimate the importance of intention for action? Thus a speaker in Thucydides (6.38.4) remarks: "One must take defensive measures not only against what the enemy does, but also against what is in his mind."⁹⁶ In a philosophy where soul moves body, the emphasis would naturally fall on the doings of the soul even when (or, rather, especially when) these are incompletely revealed in the body's outward motion. For here are the springs of action and, sooner or later, the real intention of the soul becomes the body's deed.⁹⁷

the epic and the lyric, knowledge is practical, to know is to know how; wisdom is skill in action and therefore power to act. Heraclitus, the first of the philosophers to turn to this theme, assumes as a matter of course that *logos* and *sophiē* carry the double reference of true word (and thought) and right deed (B112; cf. B1). See Jaeger, *Paideia* 1, 180.

⁹⁴ Normally this would involve much more than talk, (cf. the concept of *ponos*, above, IV, 6–8). Other fragments on *paideia* set example above precept (B208) and recommend the *mimēsis* of the good man (B39; cf. B79).

⁹⁵ E.g., Plato *Prot.* 318a.

⁹⁶ Exactly as in Democritus, B193, "it is the job of intelligence to guard against impending injustice."

⁹⁷ I say "real intention" with B81 in mind, "to be ever intending (*mellein*) makes action incomplete." In the last resort only action can sift out real intention from velleity. For the word-deed contrast to express the parallel distinction of true vs. specious intent, cf. Herod. 7.155.

3. There follows a concept of "wisdom" (*sophiē*) which is practical in the most urgent sense and is *therefore* broad enough to order both the outward life (*bios*) and the inner "form" (*tropos*) which determines the life (B61; cf. above IV, n. 79). "Wisdom" is the understanding of what is possible within the limits of what is necessary. It is, therefore, in the first place a shrewd, sharp-eyed knowledge of affairs (*euxunetos oxuderkeiē*) which can "direct most things in life" (B119). It is the Ulysses-like resourcefulness, rarely baffled by chance, whose inventions snatch use and benefit (*to chrēsimon, t'agatha*) from the very teeth of external evil and danger (B172; cf. above II, 6 and IV, 2). It is the prognosis of events without which the stupid can only learn "the hard way."⁹⁸ [61]

4. And for this very reason wisdom can serve as an inner discipline. By discerning the limits within which the external world can be changed, the wise soul changes itself, educating desire and making hope itself reasonable.⁹⁹ Without this process of reconciliation with reality, there is no "cheerfulness," as one can see from what happens to the "stupid," who "live but get no enjoyment from life."¹⁰⁰ Why not?

(i) Their battle against necessity is necessarily self-defeating. Fleeing the inescapable—e.g., old age, and death—all their efforts bring them, like Oedipus, nearer the fateful end (B203, B205).

(ii) A mirage robs them of satisfaction from the perfectly satisfying things that come their way. "The desire for more loses what is in hand: it is like the dog in Aesop" (B224; cf. B202). Often enough Democritus illustrates this with commonplace exhortations to be content with what one has. But he is also capable of applying the underlying idea with astonishing subtlety and depth: "the stupid, hating life, want to live for fear of Hades" (B199). Instead of enjoying life for what it is, they hate it for what it is not, the prelude to Hades; so they want to prolong the life they hate, in order to postpone death. It would be hard to find a better example of man being his own worst enemy through stupid disregard of the limit.¹⁰¹

CONCLUSION

At the risk of repetition, I add (a) a list of the concepts which mark the main junctions between ethics and physics, and (b) a more general interpretation of

⁹⁸ Cf. the force of *probouleuesthai* as vs. *metanoēin* in B66. For the "stupid," see B54 and B76; and cf. Hesiod *Op.* 218, "the stupid learns through suffering," as well as the theme of *pathos mathos* in Aeschylus.

⁹⁹ Cf. B185, αἱ τῶν πεπαιδευμένων ἐλπίδες, and B292, ἄλογοι τῶν ἀξυνέτων αἱ ἐλπίδες. "Rational" here does not mean, as in Plato, "in agreement with an ideal standard" but simply "realizable within the order of nature" (Cf. B58, ἐλπίδες . . . ἐφικταί . . . ἀδύνατοι).

¹⁰⁰ B200. The same thought in even stronger form in B204, if the MS reading be retained.

¹⁰¹ B294–96 shows how "wisdom" deals with an inescapable thing like old age. It takes a

the historic importance of Democritean ethics, as the first rigorously naturalistic ethics in Greek thought. [62]

(a) The Leading Concepts

(i) The soul: a specific atomic cluster, dependent for its integrity upon another cluster (the body), and having the power to move the latter. This determines an ethic which is soul-centered, but free from dualism

(ii) The "divine": any natural entity whose moral value is not less than that traditionally attached to supernatural entities of popular religion. In this sense the soul, though mortal, is divine.

(iii) "Well-being": the physical and moral state of the "cheerful" soul. It is defined positively as healthful balance (*krēsis*), negatively as the absence of violent motion

(iv) Pleasure: the "appearance" of "well-being"; therefore, to be pursued only in accordance with "what agrees with" (*sumpherein*) the soul's well-being.

(v) "Art": the soul's power to change nature. Discovered under pressure of "necessity," it can operate within the limits fixed by necessity to advance man's "power" (*dunamis*) and "self-sufficiency"

(vi) "Chance": events uncontrolled by art.

(vii) "Teaching" (*didachē*) and "hard work" (*ponos*): the directed change of the soul's inner nature. Such moral change has physical effect, since it alters the pattern (*rūmos*) of the soul-cluster.

(viii) The deed (*ergon*): the moral (and physical) motion within which the good is realized. *Logos* exists for the sake of the deed.

(ix) Wisdom (*sophiē*): insight into the order of nature which enables the soul to direct both external forces and its own inner motions of desire and hope.

(b) Democritus' Naturalistic Ethics

When Anaximander spoke of nature as an order of "justice," he did more than eke out with political metaphor the archaic vocabulary of his physics. Consciously or not, he grounded justice in a realm as immortal and indestructible as the traditional gods, but fully intelligible to man. In Heraclitus nature consciously takes the place of Olympus as the matrix of law, justice, measure, and *logos*. It is itself the "nutriment," the "common" basis and guide of all human action, public and private. Nature so regarded is more than nature. Justice is naturalized by moralizing nature. [63] Parmenides and Empedocles continue in this path. It is "justice" that holds Parmenides' Being within "the

firmly realistic view of its losses (B296) yet balances them (B294, 295) by a clear sense of the complete (*teleion*) good that comes only with old age. *Sophrosunē* is finely described as the "flower" of withered age

bonds of the measure"; and the moral axioms of the democratic polis determine the design of Empedocles' equalitarian universe.¹⁰²

The atoms and the void destroy forever this Greek venture in romantic naturalism. Nature is now dehumanized, demoralized as never before in Greek imagination. It is the nature of Thucydides, implacable and aloof. Is there room for the law of the measure in the world such as this? It was the genius of Democritus to define an ethics that meets the conditions so fixed by Leucippean physics. Nature is "necessity," not "justice"; neither good nor evil in itself; not intelligent, though intelligible. Yet its intelligibility alone, divested of any moral quality whatsoever, yields sufficient ground for the law of the measure. The good is not given to man; it is not "chance." It must be created by man; it is "art." Yet art is itself the child of necessity. As Plato would note with extreme displeasure, it is a latecomer in nature.¹⁰³ But it advances nonetheless man's self-sufficiency in nature, and this not only by mechanical invention, but also by the power of the "teaching that makes nature" to transform chance pleasure into cheerful well-being.

Anything more or less than this would be *hubris*: desire for the impossible or contempt for the possible. *Nemesis* follows on any act thus disregarding the humanly possible within the limit of the naturally necessary. This is the measure; and its knowledge empowers the soul to build upon nature goodness and justice which would otherwise not be found in nature at all. Because it masters the world so far as it can be mastered, and cures the ills of the soul so far as they can be cured, this "wisdom undismayed is worth everything" (B216).

¹⁰² Cf. my "Equality and Justice in Early Greek Cosmologies" (**1.61ff.). There is an excellent discussion of Parmenides and Anaximander in H. Fränkel, "Parmenidesstudien," *Gött. Nachr.*, Philol.-Hist. Klasse, 1930, pp. 153f. See also Jaeger, *Poietika* I, ch. 14 and R. Mondolfo, *Problemi del pensiero antico* (Bologna, 1936), ch. ii.

¹⁰³ As in *Laws* x, 889c, where the atheistic materialists teach that "as a later product of these (sc. nature and chance), art comes later." Since Plato and Aristotle wilfully use "chance" to denote the "necessity" of the *physiologoi*, this applies exactly, though not exclusively, to the Democritean doctrine.

ON THE PRE-HISTORY IN DIODORUS

REINHARDT was the first to attach Diodorus I, 7–8 to Democritus via Hecataeus of Abdera.^{1,2} His general theory met with broad acceptance.³ But it was later challenged by J. H. Dahlmann,⁴ chiefly on the allegation that (as Eduard Schwartz had suggested) the cosmogony in Diodorus I, 7 was pre-atomistic. Dahlmann's argument was examined and rejected by Philipsson,⁵ who reaffirmed his earlier view that Hecataeus' source was Epicurus. More recently J. S. Morrison accepted Dahlmann's view, though ignoring Philipsson's critique; noting similarities between the *Protagoras* myth and Diodorus I, 8, Morrison inferred that both "derive from a pre-atomistic Ionian source."⁶

This note does not propose to review the argument as a whole. It keeps to one or two points which may deserve more attention than they have yet received.

I

Judging from the theory of language in Diodorus I, 8, 3–4, Hecataeus' source must be pre-Epicurean. Reinhardt slurred over this point; he was more anxious to show that Epicurus' own theory of language was Democritean.⁷ Let us recall the two stages in the development of language clearly distinguished by

From *AJP* 67 (1946), 51–59. Used by permission. Minor changes have been made in spelling and punctuation.

¹ I am indebted to Professor B. D. Meritt for a number of helpful suggestions.

² "Hekataios von Abdera und Demokritos," *Hermes* 47 (1912), pp. 492ff. For Hecataeus of Abdera as a source in Diodorus I, see Ed. Schwartz's article on Diodorus in *R.E.*

³ E.g., Ed. Norden, *Agnostos Theos* (Leipzig, 1913), pp. 379ff.; Graf Uxkull-Gyllenband, *Griechische Kultur-Entstehungslehre* (Berlin, 1924), pp. 25ff. Diodorus I, 7–8, along with roughly parallel excerpts from Hermippus and Tzetzes, was incorporated as collateral material under frag. 5 of Democritus by H. Diels in *DK*⁵.

⁴ *De philosophorum graecorum sententis ad loquellae originem pertinentibus* (Diss., Weida, 1928), pp. 23ff.

⁵ Review of Dahlmann in *Phil. Woch.*, 49 (1929), pp. 666ff.

⁶ "The Place of Protagoras in Athenian Public Life," *CQ* 35 (1941), p. 9. To this interesting paper I owe the stimulus which led me to write this note.

⁷ Above, n. 2, pp. 501ff.

[51] Epicurus.⁸ In the first, names were "compelled" by nature.⁹ Superficially this looks like Democritus' theory that necessity is the historic source of the arts.¹⁰ In point of fact, it is characteristically and uniquely Epicurean. It departs from Democritus in a way which parallels the deviation of Epicurean epistemology from the Democritean. Feelings and impressions directly "form into shape the vocal sound";¹¹ much as in the theory of knowledge, the incoming stimulus can so mold the sensorium that the sense-image will reproduce "the very form of the physical object."¹² [52]

One can imagine Democritus' reaction to this copy-theory of sense-perception, had he lived to hear of it.¹³ The prospect of getting truth out of mere *epirusmiē* seemed to him exactly nil (frag. 7; cf. frag. 9). An *epirusmiē*-theory of language could appeal to him just as little. He marshaled formal arguments to prove that no "name" has a "natural" connection with the

⁸ *Ep. ad Hdt.* 75, 76; C. Bailey, *The Greek Atomists and Epicurus* (Oxford, 1928), pp. 267ff. and 380ff.; Robin's note on Lucretius, 5, 1028ff. and Robin-Emout on *ibid.*, 1041 (*Commentaire*, 3 [Paris, 1928]).

⁹ *Anankasthēnai*, *Ep. ad Hdt.*; cf. *at varios linguae sonitus natura subegit mittere*, Lucretius V, 1028 and *variū sensus animalia cogunt . . . varias emittere voces*, *ibid.*, 1087–88.

¹⁰ Frag. 144. See below, § II; and the writer's "Ethics and Physics in Democritus," II, § IV, PR, 54 (1945), 578–92; 55 (1946), 53–64 (**1.328ff.).

¹¹ *Ep. ad Hdt.* 75, *ἰδίως τὸν ἄερα ἐκπέμπειν στελλόμενον ὑφ' ἐκάστων τῶν παθῶν καὶ τῶν φαντασμάτων*.

¹² *Ep. ad Hdt.* 50, *καὶ ἢν ἂν λάβωμεν φαντασίαν ἐπιβλητικῶς τῇ διανοίᾳ ἢ τοῖς αἰσθητηρίοις . . . μορφή ἐστιν αὐτῇ τοῦ στερεομένου, γινομένη κατὰ τὸ ἐξῆς πύκνωμα ἢ ἐγκατάλειμμα τοῦ εἰδύλου*. I agree with De Witt ("Epicurus: All Sensations are True," *TAPA* 74 [1943], pp. 19–32) that this does not commit Epicurus to the "infallibility of all sensation." My point is not that Epicurus holds sensation to be infallible but that he does credit it with "truth" insofar as

(i) there is "likeness," *homoiotēs*, or "affinity," *sumpatheia*, between sense-image and material object,

(ii) this similarity being due to a physical deposit *enkataleimma* of the *eidolon* upon the sense-organ.

This is what separates him from Democritus. Sensation as such is not for Epicurus "bastard knowledge" (*Ep. ad Hdt.*, 50, *τὸ δὲ ψεῦδος καὶ τὸ διηματορημένον ἐν τῷ προσδοξαζομένῳ αἰεὶ ἐστιν . . .*); sense-qualities as such are not "conventional" (Sextus, *Adv. math.* 8, 63, *καὶ πάσαν φαντασίαν . . . τοιαύτην ὅποιόν ἐστι τὸ κινεῖν τὴν αἰσθησιν*). The fact of *epirusmiē* fills Democritus with black misgivings as to whether we can know "anything about anything as it really is" (frag. 7, *ἐτεῖ οὐδὲν ἴσμεν περὶ οὐδενός*). Epicurus takes it as the very basis of the veracity of sense-perception. I have left out of this discussion the difficult question as to the meaning of *epibolē*. De Witt's interpretation as "onfall" or "incidence" ("Epicurus, *Peri Phantasias*," *TAPA* 70 [1939], pp. 414–27) would strengthen my argument.

¹³ Sextus, "almost unique among critics in exhibiting no prejudice against Epicurus" (De Witt, *TAPA* 74 [1943], p. 30), puts Epicurus with Protagoras on the other side of the fence from Democritus and Plato on the question of the veracity of sense-perception (*Adv. math.*, 7, 369 and 389).

"thing"; whence it follows that the actual connection of sign with meaning can only be fixed by "convention."¹⁴

As Proclus notes, this is antithetic to the Epicurean theory of the origin of speech.¹⁵ For already in Epicurus' "first" stage, we have a system of "natural" sounds which, though rough and ready, is language in all essentials. The "second" stage elaborates and perfects at the level of common consent what was [53] already a working system at the level of "nature."¹⁶ In Diodorus, 1, 8, 3, on the other hand, speech grows from (a) "meaningless and confused sounds" (*φωνῆς ἀσήμου καὶ συγκεχυμένης*) to (b) articulate words whose

¹⁴ This is my expansion of *thesei ta onomata* in Proclus' account (*In Crat.*, 16). Steinthal (*Geschichte der Sprachwissenschaft* [2nd ed., Berlin, 1890], I, p. 76) objects to *thesei* as a "late Alexandrian" term. But it is definitely pre-Alexandrian, since Epicurus so used it (*Ep. ad Hdt.*, 75). *Onoma*, as well as *noman*, *tithenai* is good fifth-century usage (e.g., J. E. Powell, *A Lexicon to Herodotus*, s.v. τίθημι, 4 and 5). *Nomōn thesis* occurs in pseudo-Xenophon, *Ath. Const.* 3, 2 and *thesis nomatos* in Plato (see *Θέσις* in Ast, *Lexicon Platonicum* [2nd ed. Berlin, 1908]). So I find it hard to justify Steinthal's prejudice (endorsed by Reinhardt, "Hekataios von Abdera," p. 502) against *thesei ta onomata* as a possible Democritean expression. As for *tuchēi* in Proclus' account, Steinthal recalls (rightly) that the Democritean concept of "chance" makes it the very opposite of "art" and concludes (wrongly, I think) that the expression *tuchēi ta onomata* is highly suspect" (p. 177). We can see in Diodorus I, 8, 4 that it is perfectly possible to hold the "conventional" theory of language and still say *ὡς ἐτυχε συνταξάντων τὰς λέξεις*. As we see from Proclus, *In rat.*, 16, Democritus thinks of ordinary language as a rather haphazard development: there are words with more than one meaning, meanings with more than one word, and meanings with no word. So if language is thought of as a collection of signs, it is pretty much of a "chance" assortment; in that sense *tuchēi ta onomata*. But since none of these signs has a "natural" meaning and can only come by its "given" meaning through social agreement, he can also say *thesei ta onomata*. Thus *tuchēi* and *thesei*, on this interpretation, refer to different aspects of language: *tuchēi* to the development of a stock of signs, *thesei* the assignment of meaning to any one of these signs.

¹⁵ *In Crat.*, 16.

¹⁶ For a different interpretation of *Ep. ad Hdt.*, 75–76, see P. and E. DeLacy, *Philodemus* (Philadelphia, 1941), p. 140, who think of names at the "first" stage merely as "emotional cries . . . which indicated naturally . . . to other men the feelings of the person uttering them, but which did not say anything specifically about external objects. From these cries, Epicurus says, there gradually arose a system of conventional sounds referring to objects." (See also P. DeLacy, "The Epicurean Analysis of Language," *AJP* 60 [1939], pp. 87–88.) I am indebted to these authors' studies in Epicurean thought and regret that I cannot follow them on this point. For (i) it seems clear to me that in *Ep. ad Hdt.* 75 images (*phantasmata*), no less than feelings (*pathē*), evoke "naturally" their appropriate sounds; and *phantasmata* are images of objects (so, e.g., in *Ep. ad Pyth.*, 102, *τὸ τῆς ἀστραπῆς φάντασμα*; cf. *Ep. ad Hdt.*, 51, *ὁμοιότης τῶν φαντασμάτων . . . τοῖς οὐσί τε καὶ ἀληθείαι προσαγορευομένοις*). And (ii), even feelings are not merely "subjective" states of consciousness for Epicurus but are conceived, at least in the case of the *prōta pathē*, pleasure and pain, as experiences of objects, pleasant and unpleasant (Sextus, *Adv. math.* 7, 203, *ἡδονὴ καὶ πόνος ἀπὸ ποιητικῶν τινῶν καὶ κατ' αὐτὰ τὰ ποιητικὰ συνίσταται . . . ἀνάγκη καὶ τὸ ἡδονὴ καὶ τὸ ἀλγύνον ἀλγεινὸν τὴν φύσιν ὑποκείσθαι*). That the original "natural" names refer to objects is also suggested by Lucretius V, 1090, *res voce notare*.

meanings are fixed by consent. There is no suggestion here that (a) would permit intelligible communication. Meaningful speech begins only with *ti-thentas symbola* in (b). The deviation from Epicurus is a serious one; and it is unlikely that an Epicurean would be guilty of it, considering the obsession of the school with the "natural" origin of language.¹⁷

II

Neither can I credit Protagoras with the pre-history in Diodorus, for the latter contains ideas that are far in advance of anything in the *Protagoras* myth.¹⁸ Take the origin of language [54] once again. All we get in *Prot.* 322a is *ἔπειτα φωνὴν καὶ ὀνόματα ταχὺ διηρθρώσατο τῇ τέχνῃ*. Only one aspect of speech, articulation (*diēthrōsato*), is explicitly subsumed here under *technē*. This stops far short of a full-blown "conventional" theory of speech.¹⁹ Moreover, the art of speech is sandwiched in between the establishment of altars and the invention of dwellings, clothes, etc.; no attempt is made to connect it with the growth of political association. Diodorus, on the other hand, presents language as part of an orderly historical development where each stage is causally connected with its predecessor:

- (i) Men set out *sporadēn* to look for food;
- (ii) attacked by wild beasts,
- (iii) they are driven to associate for mutual help.
- (iv) In the course of this association they come to know one another, and
- (v) develop speech.²⁰ [55]

¹⁷ E.g., Diogenes of Oenoanda (ed. William), frag. 10, μήτε τῶν φιλοσόφων πιστεύομεν . . . κατὰ θεοὺς καὶ διδασχὴν ἐπιτεθῆναι τὰ ὀνόματα (and cf. unknown Epicurean cited by William *ad loc.* from *Herculaneum Voluminum Collectio Altera*, 7, col. 26, φύσει δὲ τὰς πρώτας τῶν ὀνομάτων ἀναφωνήσεις γεγονέναι λέγομεν). Cf. also Lucretius V, 1028ff., where the second stage of the Epicurean theory has shrunk to near-extinction: it is given less than a line, in 1029.

¹⁸ It is a pity that this should be our only source for Protagorean pre-history. For if *Περὶ τῆς ἐν Ἀρχῇ Καταστάσεως* (DK 80B8b) be accepted as the title of a genuine Protagorean treatise, we should assume that Protagoras had a systematic theory, picturesque fragments of which are all that survive in the Platonic fable. Under the circumstances, however, we must judge Protagoras' pre-history by these meager remains. We cannot credit him with ideas which he might perhaps have held but which are not substantiated, directly or indirectly, in the *Protagoras* myth.

¹⁹ It is significant that the tradition credits the "conventional" theory of speech to Democritus, never to Protagoras; so, e.g., Proclus' *In Cratylum*; so too the *Cratylus* itself, where Protagoras gets a beating on other counts (385e ff., 391c), but with no suggestion that the conventional theory of language is one of his many sins.

²⁰ I, 8, 1-4. In the *Protagoras* myth, steps (i), (ii), and (iii) occur in 322b, after the invention of the arts of religion, speech, industry, and agriculture in 322a. In Lucretius V, 958-1090, on the other hand, we have roughly the same sequence as in Diodorus, I, 8. Both the Protagorean view that words were articulated by "art" and the Democritean that words were given meaning by

The political function of speech is so clearly grasped that ethnic differences are conceived as essentially linguistic in origin (1, 8, 4).

More conclusive are two further considerations: (a) that the pre-history in Diodorus identifies the cause of the emergence of the arts, while the *Protagoras* myth does not; (b) that the pre-history in Diodorus clearly excludes a teleological interpretation, which the *Protagoras* myth does not.

As to (a), Diodorus I, 8, 7 offers a *genetic* theory, which names "necessity"²¹ as the primary cause of man's cultural origins. There is nothing like this in the *Protagoras* myth. What we get there instead is the *analytic* principle that the human arts are analogous to the biological devices by which animal species survive: each species, animal or human, is endowed with its peculiar *dunamis eis sōtērian* (320e). The source of these survival-weapons is assigned to the allegorical agency of conventional gods, i.e., left unexplained.

Now (b), it is certainly possible to interpret the origin of these survival-weapons in mechanistic terms—i.e., in terms of "chance" variations, the elimination of unsuccessful variants, and the survival of the fittest. This interpretation is a possible one for us; and it was possible in the fifth century for any student of Empedocles.²² Nevertheless, there is nothing in the myth to decide in favor of this interpretation. The fact that each species was equipped with a distinctive "saving power" was equally susceptible of teleological interpretation; and this construction is just what we find in two passages, each of which bears striking similarities to certain parts of the *Protagoras* myth:²³ Herodotus III, 108 cites the high rate of reproduction, [56] which enables "timid and edible creatures" to survive (cf. *Prot.* 321b), as an instance of the wisdom of divine providence (τοῦ θεοῦ ἡ πρόνοια . . . ἐοῦσα σοφῇ), while Aristotle (*De part. animal.* 662b28-663a8) assimilates other survival-weapons cited in the *Protagoras* myth into his usual teleological schema.²⁴

"convention" make way for Lucretius' soundly Epicurean doctrine of the "natural" origin of language (1028-90). Lucretius, however, as Epicurus may have done before him, attempts to merge as best he can the "natural" origin of speech with its political utility. When he balances *natura subegit* in 1028 with *utilitas expressit* in 1029, I assume he is thinking of the political uses of speech that he has just discussed in 1019-27: communication is indispensable for the *foedera* (1029) without which *genus humanum iam tum foret omne peremptum* (1026).

²¹ *Chreia didaskalos*, Diodorus I, 8, 4, which is obviously an alternate for *anankē didaskalos* (so in the parallel in Tzetzes, DK, II, p. 138, line 1). Cf. the interchangeable use of *chreia* and *anankē* in *On Ancient Medicine* 3, αὐτὴ ἡ ἀνάγκη ἐποίησε ζητηθῆναι . . . διὰ ταύτην τὴν χρειαὴν ζητῆσαι.

²² Cf. Aristotle's statement of the mechanistic theory: ταῦτα μὲν ἐσώθη ἀπὸ τοῦ αὐτομάτου οὐσάντα ἐπιτηδείως· ὅσα δὲ μὴ οὕτως, ἀπώλετο καὶ ἀπόλλυται, καθάπερ Ἐμπεδοκλῆς λέγει τὰ βουγενῆ ἀνδρόπρωρα (*Phys.* 198b30-32).

²³ See S. O. Dickerman, *De argumentis apud Xenophanem*, etc. (diss., Halle, 1909), pp. 53ff. and 77ff. Nestlé had argued for Protagorean influence on Herodotus III, 108 in ("Bemerkungen zu den Vorsokratikern und Sophisten"), *Philol.* 67 (1908), p. 531-81, here 553.

²⁴ As Dickerman pointed out (*De argumentis*, p. 77), the Aristotelian parallel is strengthened

It is most likely, however, that Herodotus and Aristotle, like the Christian fathers later, were simply reading their own piety into the *Protagoras* myth. This leaves us with no positive explanation of the origin of the arts; and agnosticism as to the cause would be in character with Protagorean positivism. On this assumption we can explain how (1) the teleologically minded could draw from the *Protagoras* myth edifying instances of creative purpose, while (2) a mechanist could also fit the same facts into his own drily materialistic scheme of natural evolution. The latter alone could furnish the nonteleological source we need for the pre-history in Diodorus.

Who then was the first to explain both biological evolution and cultural origins by the single concept of necessity? Frag. 144 of Democritus gives the answer: the arts were "separated out by necessity" (*apokrinai t'anankaion*). Anaxagoras too had used the cosmogonic *apokrisis* to account for human origins.²⁵ But there is the well-known indecision as between teleology and mechanism in Anaxagorean thought; and this conflict reveals itself in a strangely anthropocentric twist in Anaxagoras' concept of cosmic evolution.²⁶ It was left for Democritus to expunge all teleological residues and account for the origin of the human arts, as well as of planets, plants, and animals, as products of physical necessity. This is a speculative achievement of the highest order, and [57] we have no warrant for crediting it to Protagoras or anyone else before Democritus himself.²⁷

The pre-history in Diodorus not only harmonizes broadly with this necessitarian philosophy of cultural origins; it explicitly consigns *χείρας καὶ λόγον καὶ ψυχῆς ἀγγίνοιαν* to a subordinate role in the development of the arts: they are mere *sunergoi* of necessity (1, 8, 7). As Reinhardt suggested (above, n. 2), p. 499, this looks like Democritean polemic against Anaxagoras.²⁸ To

by another strikingly similarity to the *Protagoras* myth: the fourfold classification in Aristotle (*De part. animal.* 662b1–16) of animals into flesh-, herb-, fruit-, and root-eaters agrees exactly with the four types of animal food in *Prot.* 321b.

²⁵ Frag. 4.

²⁶ E.g., the notion that every *apokrisis* produces men, with their cities, fields, etc. "as with us; and that they have a sun and a moon and the rest as with us" (frag. 4); to which Democritus may have been replying when he taught that some worlds are without sun and moon, and some are without any living creatures (Hippolytus, *Refut.* 1, 13, 2–4 = DK. 68A40). To this aspect of Anaxagorean thought, my attention was first called by Uxkull-Gyllenband (above, n. 3), pp. 10ff. For a critical comment on his view, see § IV of my paper, cited above, n. 10.

²⁷ I assume that chapter 3 of *On Ancient Medicine*, with its remarkable doctrine of necessity as the cause of discovery in the medical arts (see above, n. 21), is later than Democritus.

²⁸ Aristotle, *De part. an.* 687a7, "Ἀναξαγόρας μὲν οὖν φησὶ διὰ τὸ χεῖρας ἔχειν φρονιμώτατον εἶναι τῶν ζῴων ἀνθρώπων. (See also DK 61A6; for further parallels see Dickerman, *De argumentis*, p. 28n.1.) Elsewhere Anaxagoras makes human intelligence the cause of man's mastery over the other animals (frag. 21b). Thus hands and intelligence sum up the Anaxagorean principles of human progress. To mention both only to relegate them to second place after necessity suggests, though of course does not prove, a conscious reference to Anaxagoras in Diodorus' original source.

find it here in Diodorus strengthens the case for the Democritean character of the source.

III

What of Dahlmann's argument that the cosmogony in Diodorus I, 7 is pre-atomistic (with consequent prejudice to the pre-history in I, 8)? Philipsson went into this matter in detail and found some additional evidence to vindicate the Democritean authorship of the zoogonic *humenes*.²⁹ I have nothing of consequence to add here and will simply annotate his conclusion. He finds just one deviation from Democritean cosmology in Diodorus: the idea that the sun belongs to our world from the very first and does not come into it from the outside; and this, he thinks, confirms his own theory that the source is Epicurean.³⁰

Here is the crucial passage: "The fiery part (*sc* of the air) gathered into the highest regions, for anything of this nature, being light, moves upward;³¹ and this is the cause of the sun and the rest of the stars being caught up into the universal whirl."³² [58] The only direct collision of this passage with traditional accounts of Democritean cosmology is with pseudo-Plutarch's *Stromateis* 7.³³ There we get the curious³⁴ view of two stages in the creation of the stars: (1) an original pre-fiery phase, and (2) a later enlargement of the orb of the sun³⁵ by taking in fire. Diodorus is not flatly inconsistent with (2) but completely ignores (1). Assuming that *Strom.* 7 is reliable, the discrepancy could be explained through attrition or simplification of Democritean doctrine on its way to Diodorus.

CONCLUSION

These observations do not amount to anything like a conclusive argument. But so far as they go, they strengthen the assumption that Diodorus 1, 8

²⁹ Above, n. 5, pp. 671–73.

³⁰ *Ibid.*, p. 671.

³¹ The rising of fire is explained here consistently with Democritean physics (*De caelo* 309a1f.).

³² The last clause is characteristically Democritean. Cf. Lucretius V, 624, *cum caeli turbine ferri*. The movement of the whirl "vanishes" in the lower regions: so *enapoléphthēnai tēi dinēi* makes good sense: when they rise high enough they are "caught up" in the whirl.

³³ H. Diels, *Dox. Graeci* = DK. 68A39.

³⁴ I say "curious," because, on Democritean assumptions, would we expect any large earthy body to keep its place in the air over a long period, instead of moving to its "like" (frag. 164), the earth?

³⁵ Following Bailey's translation of μεγεθοποιημένου τοῦ περὶ τὸν ἥλιον κύκλου (above, n. 8), p. 150.

represents broadly a Democritean point of view. Just how much of Democritus survives the double filter of Hecataeus and Diodorus, we cannot tell. The value of the passage for Democritus is, therefore, distinctly less than that of a secondary source. It can only be used to fill out ideas for which some independent warrant exists in surviving Democritean fragments.

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